REVIEW AND FORECAST Number

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★ 46" x 10½" brake rings.

★ 24" x 40" drum barrel.

★ Full vision air panel control, the best control arrangement on any drilling rig.

★ Air-Tube disc clutches — the world's best — ON ALL DRIVES.

★ New two-speed friction clutch transmission with Air-Tube disc clutches.

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★ New Air-Tube disc clutch on water pump drive controlled from driller's control panel.

★ New sectional box type compound, the first of its kind. Each engine and compound section can be moved in one unit without danger of engine getting out of line with compound.

★ New Auxiliary Accessory drive built into compound, a feature that is exclusive, so far as is known.

and you'll choose... Wilson ATLAS RIG

RATED CAPACITY:
10,000 ft.—4½" Drill Pipe
12,000 ft.—3½" Drill Pipe

Wilson MANUFACTURING CO., Inc.
WICHITA FALLS, TEXAS

PRICE 50 CENTS TABLE OF CONTENTS PAGE 179 JANUARY 28, 1952

You Can RELY ON ROCKWELL

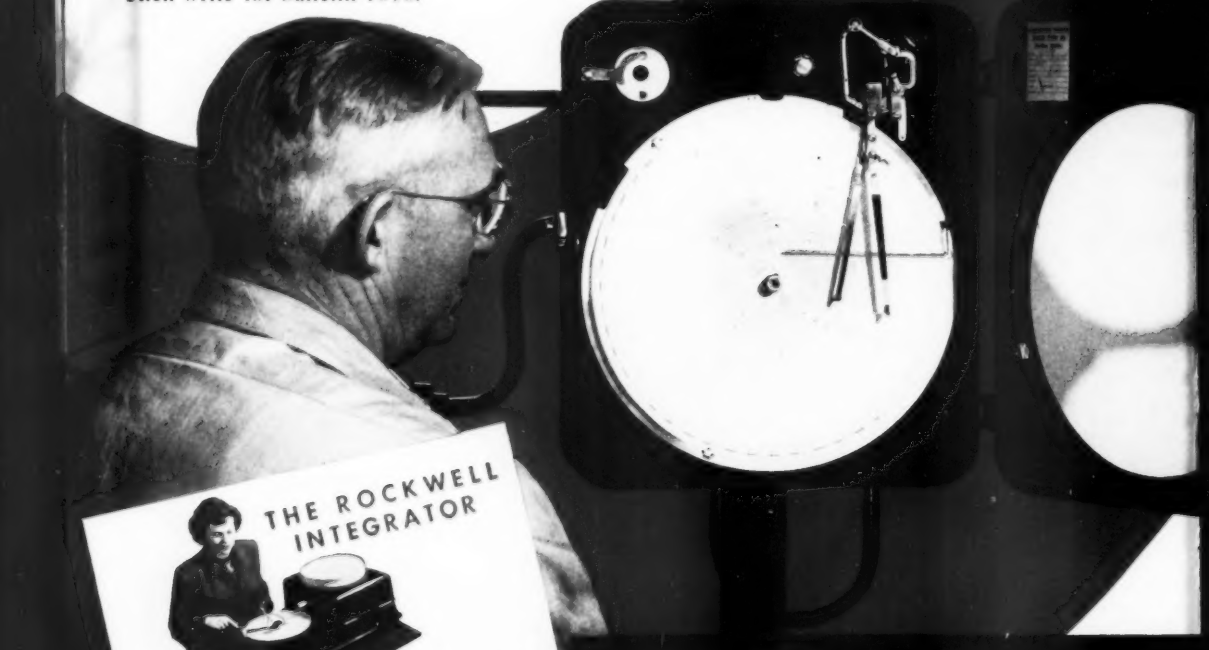
ORIFICE METERS

to save you money!

EXCLUSIVE!

Self-Lubricating, Leakproof Stuffing Box

You get more than just precision measurement out of Rockwell orifice meters. You get a strongly built, soundly engineered mechanical construction—one that stays "on stream" for long periods with minimum attention. You get the added advantage of *flexibility*, for the Rockwell gauge quickly converts to any one of six standard ranges by simply interchanging high side chambers. And you gain the service ease of a fully accessible arrangement of working parts. Want more facts on these money saving features of Rockwell orifice meters? Then write for bulletin 1050.



THE ROCKWELL INTEGRATOR

Mechanically calculates orifice meter charts of various makes. Extension appears as a total on a straight reading register. Operator traces contrasting colored lines over static and differential records to verify results. One Rockwell integrator will handle upwards to 300 average charts a day.

ROCKWELL MANUFACTURING COMPANY

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Atlanta • Boston • Chicago • Columbus • Houston • Kansas City
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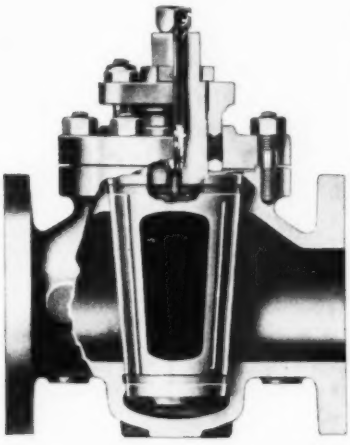
WALWORTH

Lubricated

Plug Valves

for TOUGH *assignments*

where tight shut-off...
and easy operation
are "MUSTS"



Walworth Lubricated Plug Valves Offer These Advantages

- Complete surrounding of ports with resistant lubricant affords positive seal against leakage.
- Lubricant grooving system assures ease of operation — tight shut-off — greater protection against corrosion.
- Body and plug fully protected by lubricant from attack by line fluids.
- Quarter turn opens or closes valve.
- Made in a complete range of sizes ½" to 26" and for pressures from 175 to 5,000 psi., and for vacuum requirements.

For handling petroleum products, natural or manufactured gas, acids, alkalies, solvents, slimes, slurries . . . in fact for almost any hard-to-handle liquids—there's a Walworth Lubricated Plug Valve designed for the job.

Easy to operate, tight sealing, resistant to wear and corrosion, Walworth Lubricated Plug Valves assure long years of dependable service at low operating cost.

Walworth Lubricated Plug Valves are available in sizes ½" to 26" for pressures from 175 to 5,000 psi., and for vacuum requirements. For full details—prices, sizes, dimensions, and other pertinent data, see your Walworth distributor or write to:

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to Oil Field Standards!

Fairbanks-Morse 8-Cover Side-Pot Duplex Power Pumps are built *UP* to the rugged design and conservative standards of oil field pump practice . . . built *UP* to last . . . built *UP* to liberal strength and safety factors.

They are not built down to achieve lighter weight with consequent sacrifice in design, materials and dependability. Light weight in an oil field power pump is a dubious advantage at best. Strength and service are the important considerations.

When you want dependable, efficient, long-life, low-cost service, your choice should be Fairbanks-Morse, the power pumps that set performance and economy records wherever they are used. Fully bronze-fitted, oil-fitted, or slush-fitted styles. Fairbanks, Morse & Co., Chicago 5, Ill.

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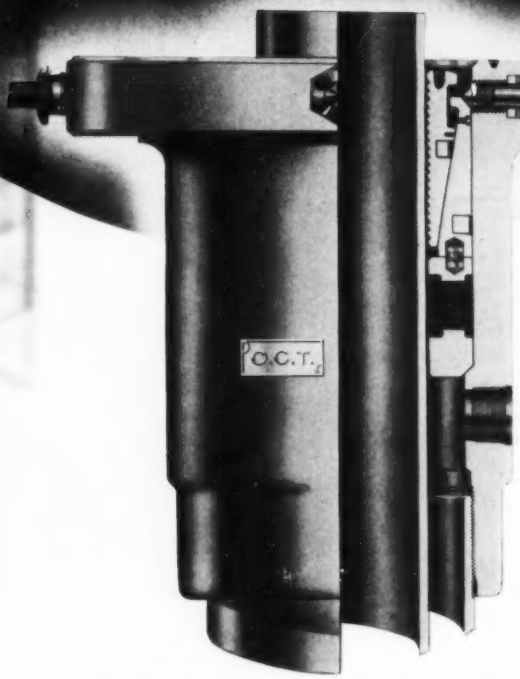

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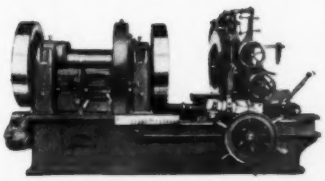

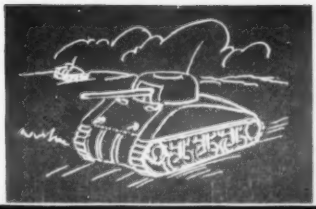

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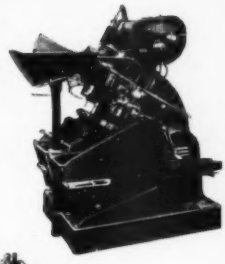
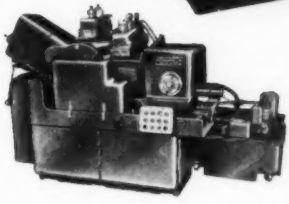
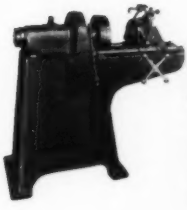
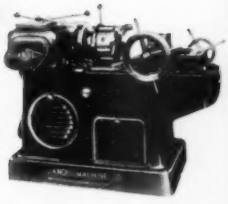
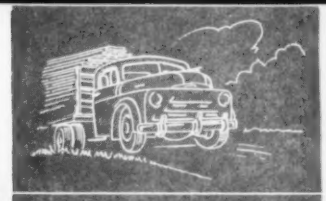
. . . FOR DEFENSE AND PEACE

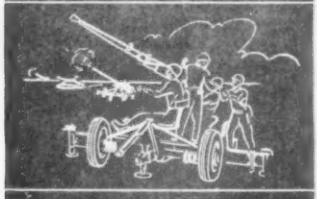


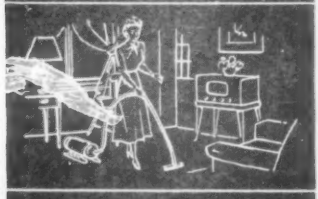






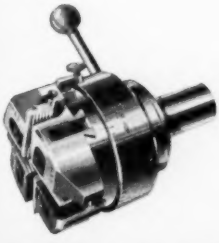






Threads to open bomb doors, or secure warheads on naval rockets—threads to help steer pleasure cars, or to adjust microscopes in research. All of these are produced by one or another of the many types of Landis Threading Equipment, equally adapted to making America strong in war, or building a land of plenty in peace.

Behind this equipment—pipe, bolt, and nipple threading machines, centerless thread grinders, collapsible taps, die heads, chasers—lie years of experience in thread generation and threading equipment manufacture. We offer this know-how to all manufacturers through our Thread Engineering Service. We are ready to help where we can with original thread design, development of threading methods, or adaptation of threading equipment for production. Send us your specifications, or our representative will call at your convenience on request.



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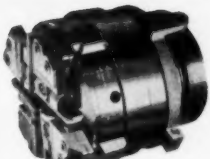


Represented in the Domestic Oil Fields by: Colcord-Wright Machinery & Supply Co., St. Louis, Mo.; C. J. Harter Machinery, Houston, Texas; Frederic-Baker Co., New Orleans, La.; Moore Machinery Co., Los Angeles and San Francisco, Calif.; Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

MOST SATISFACTORY FOR CEMENTING AT DESIRED POINT!

HALLIBURTON'S DM AND DC SQUEEZE PACKERS

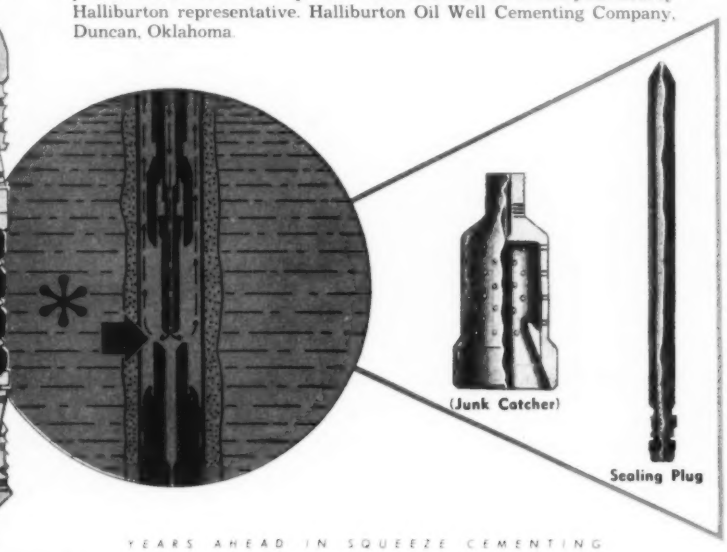
You get more complete control in placing cement or fluid exactly where you want it with the type "DM" or "DC" Squeeze Packer. This control permits squeezing through the tubing or drill pipe to the more critical points – behind the casing or liner, around the shoe or shoe joint, or to any other point where cement is desired.

These squeeze packers were designed for a safe application in any well, regardless of depth and pressure, to assure a positive fluid "shut-off" from either direction.

The packer may be set immediately by simple, positive mechanical action. It remains open until set, can circulate or reverse the circulation at any time while running in. Tubing and circulation valve are free from packer before squeezing begins, there are no threads to unscrew to get loose from packer after cement is placed.

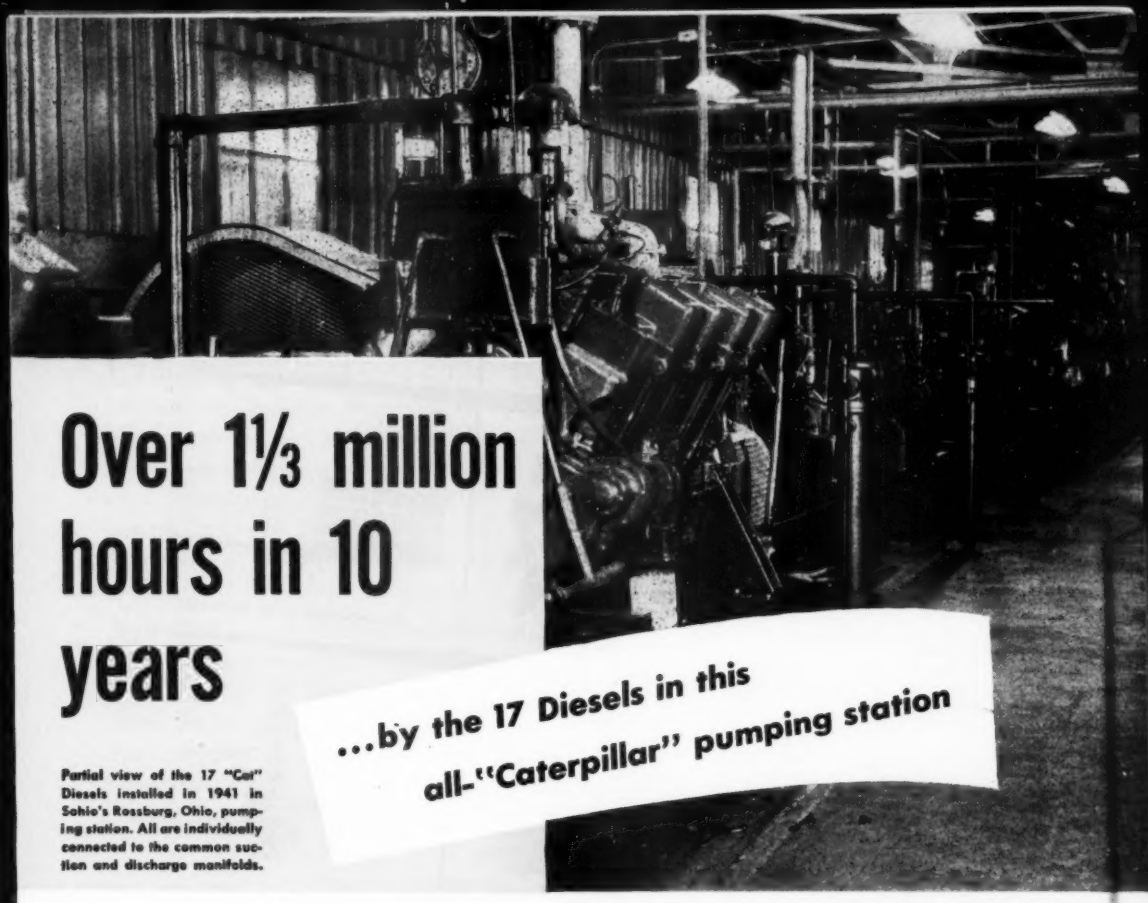
Type "DM" is made of high strength drillable magnesium alloy, type "DC" of drillable cast iron. Both can be used for any squeeze job or where a temporary Bridge Plug is desired. Type "DC" is very effective as a permanent Bridge Plug.

Get satisfactory cementing at the desired point on your next squeeze job – with Halliburton's improved DM or DC Packer. Phone your nearby Halliburton representative. Halliburton Oil Well Cementing Company, Duncan, Oklahoma.



YEARS AHEAD IN SQUEEZE CEMENTING

HALLIBURTON



Over 1⅓ million hours in 10 years

...by the 17 Diesels in this all-"Caterpillar" pumping station

Partial view of the 17 "Cat" Diesels installed in 1941 in Sohio's Rossburg, Ohio, pumping station. All are individually connected to the common suction and discharge manifolds.

If ever a "case history" testified to the long life and continuous operation of "Caterpillar" Diesel Engines, this installation does so convincingly. Here, at the Sohio Pipeline Company's Rossburg, Ohio, station, 17 "Cat" Diesels (D17000s and D13000s) have been in active service for ten long, hard-working years. One serves as oil-change standby. Another is standby for overhauls, tune-ups and parts replacements. Thus, 15 engines are always running—24 *hours a day*.

Deducting down-time for overhaul (about every 5,000 hours per unit) and servicing, the group has rolled up approximately 1,400,000 engine hours. This does not include the fact that nine of these engines had seen service before being installed at the Rossburg station. Their further, unspent life still challenges an accurate guess!

Sound engineering and earnest manufacture are the basis for these Diesels' quality and sturdiness. Sensible care and maintenance have been the pay-off in their record of dependable performance. Yet, their history is but a reflection of the individual history of thousands of mates at work in the oil, mining, quarrying, contracting, lumbering, transportation, fishing and other industries.

A timely word: The finest machines are subject to wear—yet responsive to care. Good maintenance is doubly important today. There's nothing like stitch-in-time inspection to help obtain the long life built into your "Caterpillar" equipment. Call in your "Caterpillar" Dealer. Let him rebuild parts before excessive wear makes them unsalvageable.

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Oilfield Engines

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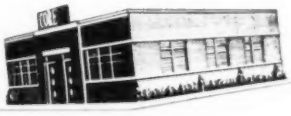
ON-LOCATION CORE ANALYSIS

STATION WAGON CORE ANALYSIS

SUITCASE CORE ANALYSIS

FROZEN CORES

SIDE WALL CORE ANALYSIS



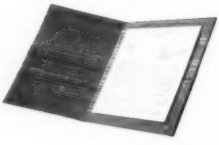
OFF-LOCATION CORE ANALYSIS

WELL LOGGING (on-shore)

WELL LOGGING (off-shore)

WELL SAMPLING

RESERVOIR FLUID ANALYSIS



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PETROLEUM RESERVOIR ENGINEERING

Served 3 Years

and drilled 16 wells—a total of 120,000 feet of hole

OPERATORS of one southwestern drilling rig turned to the G.T.M. —Goodyear Technical Man—for recommendations on rotary hose. The Style 3153—built with Goodyear's exclusive integrally streamlined coupling at the factory—drilled 120,000 feet of hole in sinking 16 wells.

Style 3153 is built to handle extreme bottom-hole pressures at levels down to 15,000-20,000 feet — is tested at 5000 lbs. psi. before shipment. Ask your supplier for details, or write Goodyear, Akron 16, Ohio.

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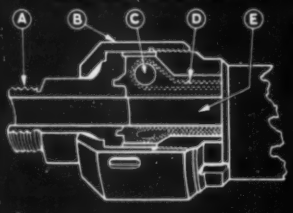
with integrally streamlined end



A—threaded adapter attached to goose neck

B—streamlined shell

C—annular ring of steel reinforces hose end

D—multi-ply reinforcement of hose

E—mud, sand, oil and abrasion-resistant tube

FOR HOSE, FLAT BELTS, V-BELTS, MOLDED GOODS, PACKING, TANK LINING, RUBBER-COVERED ROLLS *built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor. Look for him in the yellow pages of your Telephone Directory.*

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Operated in conjunction with a properly designed gas scrubber at recommended loads and speeds these engines with a minimum of servicing can be counted on to give years of continuous trouble free operation. Complete details are contained in new engine catalog which will be mailed on request.

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FOR PNEUMATIC TRANSMISSION AND CONTROL SYSTEMS

Duplex *Receiver* Duragauge—3½" Dial Size. Peripheral pointer is red.

Compact panelboard design demands pressure gauges that combine extreme accuracy with smaller size, easy-to-read dials. *The new Ashcroft Receiver Duragauges, with 3½" dial, meet those requirements exactly.*

Wherever pneumatic transmission and control systems are used to indicate pressure, temperature or flow—in power plants, refineries, chemical plants—these new *Receiver* Duragauges provide *accuracy within ½ of 1 percent of the dial range.* Standard transmitted air pressure range is 3 to 15 P. S. I. Other ranges include 2 to 14, 2 to 15, 3 to 18 and 5 to 25 P. S. I.

Single and Duplex *Receiver* Duragauges are available. The Duplex incorporates two separate sets of Bourdon tubes, movements and pointers. Bourdon tube material is heat-treated phosphor bronze, extra wide for extreme sensitivity, with long tip travel for precision accuracy.

Get complete data, including dimensions and standard graduations. Your Ashcroft Distributor will gladly help you select the right *Receiver* Duragauges for your specific needs.

1850 ASHCROFT U.S.A.

ASHCROFT GAUGES

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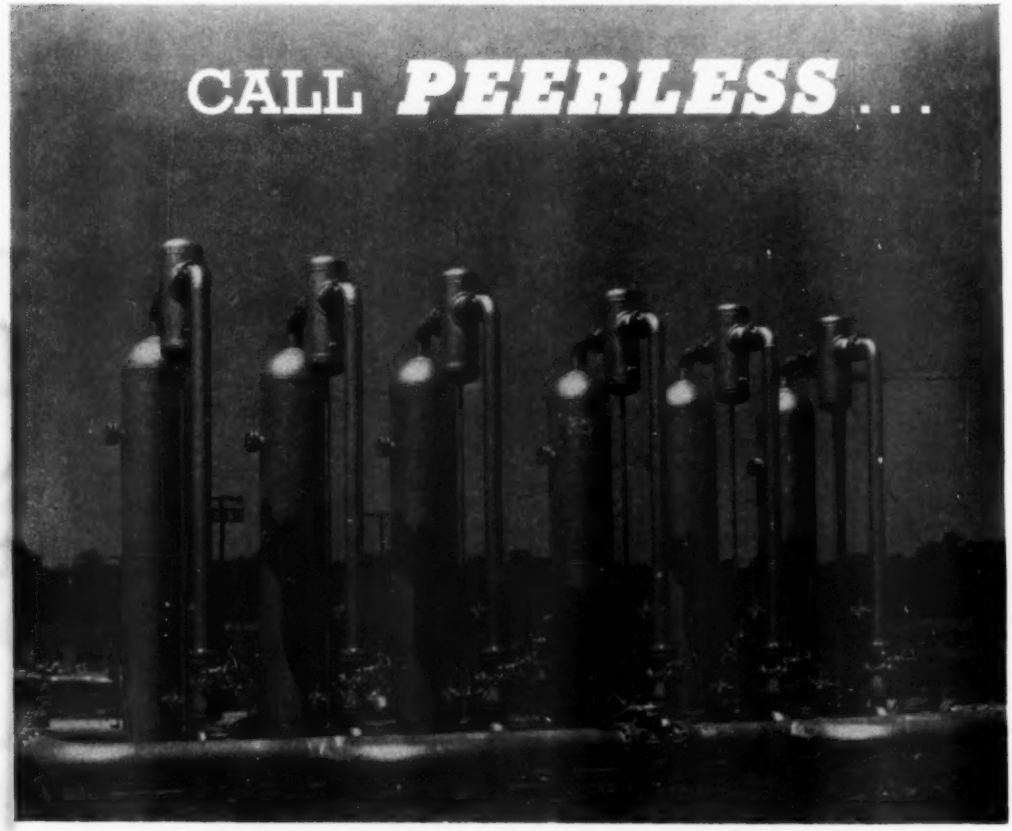
MAKERS OF ASHCROFT GAUGES, HANCOCK VALVES, CONSOLIDATED SAFETY AND RELIEF VALVES, AMERICAN INDUSTRIAL INSTRUMENTS, BUILDERS OF "SHAW-BOX" CRANES, BUDGIT AND LOAD LIFTER HOISTS AND OTHER LIFTING SPECIALTIES

Have ENTRAINMENT PROBLEMS..?



. . . SPECIALISTS in the SEPARATION LIQUIDS and GASES!

Graphically illustrated is the use of the Peerless line separator to eliminate liquid entrainment losses.

This installation is typical of the many successful applications of Peerless equipment.

Consult Peerless for help in solving your entrainment problems.

PEERLESS MFG. CO.

PEERLESS MANUFACTURING CO.

P O BOX 7193 ★ DALLAS, TEXAS ★ DIxon 8431

REPRESENTATIVES IN ALL PRINCIPAL CITIES

nearly 10,000 HOURS
without shutdown!

PRODUCTS

OIL BURNERS and GAS BURNERS for industrial power, process and heating purposes; STEAM ATOMIZING OIL BURNERS; MOTOR-DRIVEN ROTARY OIL BURNERS; MECHANICAL PRESSURE ATOMIZING OIL BURNERS; LOW AIR PRESSURE OIL BURNERS; GAS BURNERS; COMBINATION GAS and OIL BURNERS; AUTOMATIC OIL BURNERS, for small process furnaces and heating plants; FUEL OIL HEATERS; FUEL OIL PUMPING and HEATING UNITS; FURNACE RELIEF DOORS; AIR INTAKE DOORS; OBSERVATION PORTS; SPECIAL REFRACTORY SHAPES.

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FOR YOUR PETROLEUM HEATERS

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INDUSTRIAL OIL BURNERS, GAS BURNERS, FURNACE EQUIPMENT

Operating entirely without human attendance is this Union Oil pump station in the Sunset Field near Taft, California.

These Bristol Metameter telemeters transmit readings of temperature, pressure, and flow-rate of the outgoing oil from Sunset Station to McKittrick Pump Station, 30 miles away, where the readings are recorded and indicated on the Metameter Receivers shown below, thus enabling the engineer at McKittrick to keep an eye on Sunset Station.

Metameter* Telemeters Enable Union Oil to Supervise Operation of Unattended Pump Station

The Union Oil pump station at Sunset Field is self-operating. The crude oil is heated to the desired pumping temperature and moved through the pipe line at a prescribed rate of flow. Pumping is slowed down, speeded up, or shut down entirely, if trouble arises or the job is finished. Operations are continuously reported by Bristol Metameter telemeters to McKittrick Pump Station 30 miles away where a Metameter Receiver records the flow-rate of the oil leaving Sunset Pump Station and two Metameter Receivers indicate its pressure and temperature.

Bristol Metameter telemeters are offered in a wide variety of models to take care of almost every type of application involving remote measurement and automatic control (a few feet or many miles) of pressure, vacuum, flow, temperature, liquid level, position, and electrical quantities.

Readings can be transmitted over telephone circuits, carrier channels, private wires, or radio, including microwave. Thousands of installations now in operation from coast to coast. Write for Bulletin M-1700. The Bristol Company, 120 Bristol Road, Waterbury 20, Connecticut.

Reg. U. S. Pat. Off.

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AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

• *Into the Pacific goes the first section of a 4,200 foot submarine pipeline. Built to load and unload tankers, this line will speed vital oil on its way.*

Down to the Sea in Pipes

30 HOUR SCHEDULE BEAT BY 36%!

• *In exactly 19 hours, two, 4,200 foot lines were laid beneath the Pacific with the aid of five Trackson PIPE LAYERS!*

The husky Trackson-"Caterpillar" teams lifted heavy, 250-foot sections of 20" pipe... carried them to the launching track . . . laid them carefully on dollies without damage to the cement coating.

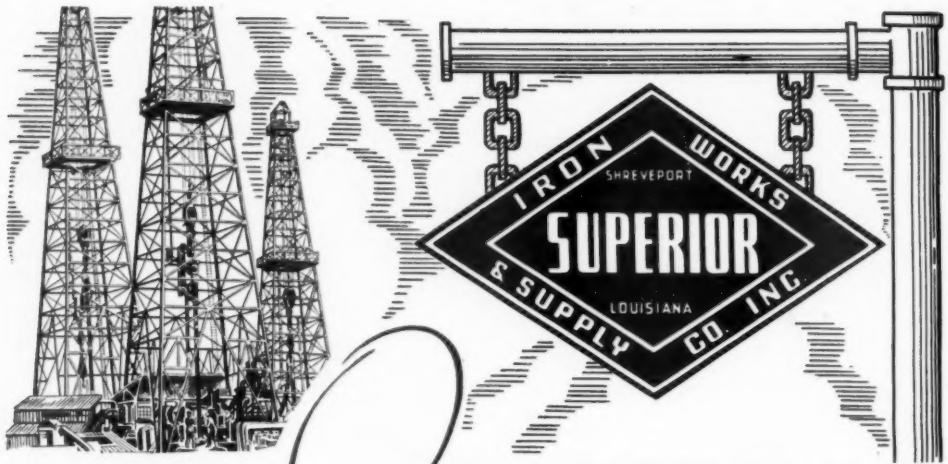
Pacific Pipeline Construction Co. estimated laying time for the line, built to load and unload tankers at Ventura, Calif., at 30 hours. Trackson speed, power and precision control cut the estimate by 11 full hours!

These same Trackson PIPE LAYER advantages can save time and money for you. Count on beating schedules with Trackson PIPE LAYERS. Ask your "Caterpillar" Dealer to help you plan the spreads for your next contract.

TRACKSON COMPANY, Milwaukee 1, Wisc.
A subsidiary of Caterpillar Tractor Co.

TRACKSON

TRAXCAVATORS®
PIPE LAYERS
TRACLOADER
EARTH AUGER



FROM *One* PIONEER TO *Another* ...

When those pioneers in major oil field development first tapped the vast East Texas underground stores in 1930, they knew even then they could call *Superior* for fast, dependable service.

Yes, Superior was on hand in 1930 as in 1951—pioneering to bring the oil, gas, and pipeline industries the best in equipment. No matter *what* your operation—drilling, production, pipelining, or refining—Superior can give you top-notch supplies and technical advice in a hurry. No matter *where* your operation—there's a Superior store in calling distance to fill your order immediately.

Save time and money—call your *Superior* store!

13 CONVENIENT STORES AND OFFICES TO SERVE YOU

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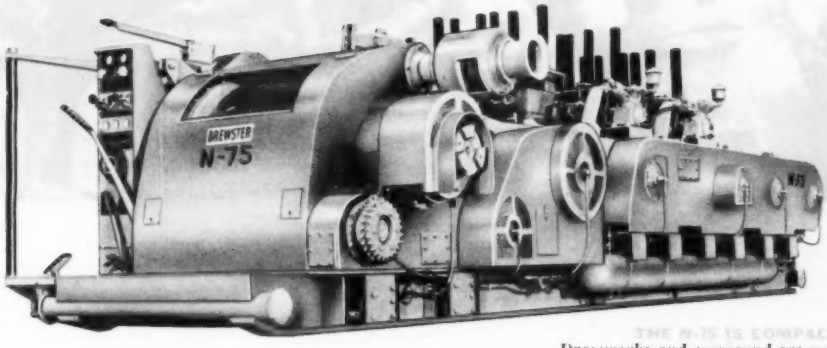
New York City—Room 1212, 502 Park Avenue
Telephone: El Dorado 5-3572

SUPERIOR IRON WORKS & SUPPLY COMPANY, INC.

1202-04 MARSHALL STREET • P. O. BOX 1800 • SHREVEPORT, LA.

BREWSTER
N-75
DRAWWORKS
FOR
10,000'
DRILLING

OVER *40 Years* EXPERIENCE



Drawworks and compound are mounted on a single H-Beam skid for easy handling.

The N-75, newest development of Brewster's oldest drawworks, has stepped up its power and put on extra brawn to meet your need for a rig which will stand up under tougher drilling programs. Like its predecessors, a 1932 model, which is still in operation, and the popular N-7, it is packed with years of rugged service. The N-75, already in use in many fields, has proven itself a worthy member of the Brewster family of fine drilling equipment.

FEATURES

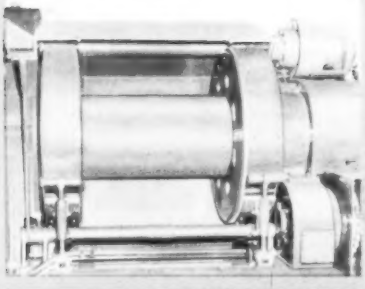
- Drum core larger and longer.
- Larger chains on high and low drum drives.
- Auxiliary positive clutch built into low drum friction clutch.
- Power increased from 600 to 700 horsepower.

THE BREWSTER COMPANY, INC. — SHREVEPORT, LOUISIANA

BREWSTER DRILLING EQUIPMENT

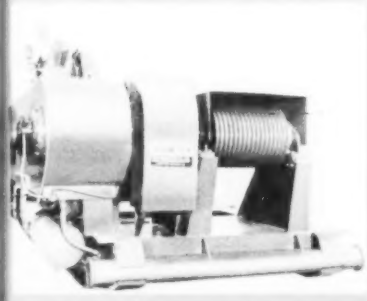
ASK YOUR NEAREST SUPPLY HOUSE TO TELL YOU ABOUT THE EXTRA BRAWN IN BREWSTER'S N-75.

Apex Equipment Company • Murray Brooks, Inc. • Reams Supply Company
Bonnird Supply Company • Industrial Supply Company • In Canada:
Rocky Mountain Supply Company — Direct and through recognized export dealers.



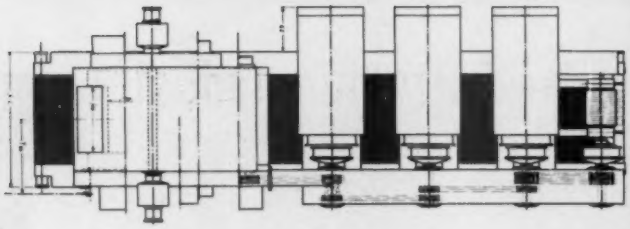
N-75 DRUM

Cast steel core, 40½" long x 21" diameter, with 48" steel flanges pressed on the shaft.

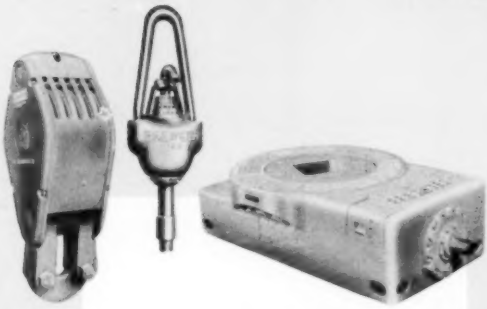


N-75 PUMP DRIVE

Any size sheave can be mounted on the shaft to match the sheave on the pump.



Plan of N-75 with 3-engine compound. 2-engine model is also available.



AUXILIARY DRILLING EQUIPMENT

You can get the most out of your N-75 when you use Brewster auxiliary equipment.

200 TON TRAVELING BLOCK

6-S OILBATH SWIVEL

RSH 18" ROTARY

THE BREWSTER COMPANY, INC. · SHREVEPORT, LOUISIANA

SPECIFICATIONS FOR BREWSTER N-75 DRAWWORKS

Recommended Total Available Horsepower	700
Max. Dia. Drum Shaft SAE 4140 Alloy Steel	6¼"
Drum Flange Diameter	48"
Drum Spool Diameter x Length	21" x 40½"
Brake Lining Size	1" x 9"
Net Braking Surface (Lining) Square Inches	2376
High Speed Drum Clutch	Twin Disc Friction
Low Speed Drum Clutch — Positive Jaw and Twin Disc Friction Drum Drive Chains	1¾" Triple

Transmission:	
Max. Shaft Size	6-3/16"
Shaft Dia. in Bearings	4¾"
Chain Size	1¾" Double
Master Clutch	Twin Disc P-2-24 Friction
Reverse	2-Speed Gear
Rotary Clutch Size	Twin Disc P-2-18 Friction
Size Main Skid Members	14 H
Approx. Over-all Height	80"
Approx. Width of Skids	7'-0"
Approx. Weight of 2-Engine Drawworks, less Engines	45,500 lbs.
Approx. Weight of 3-Engine Drawworks, less Engines	50,000 lbs.

Transmission Speeds	Cathead Shaft RPM	Rotary Drive Sprocket RPM 27T-2" P.	Low Speed Drum Drive Line Speeds and Pulls	High Speed Drum Drive Line Speeds and Pulls
Low	101	203	270' Min. 72,000 Lbs.	970' Min. 20,000 Lbs.
Second	146	297	395' Min. 52,000 Lbs.	1,415' Min. 15,000 Lbs.
Third	223	429	572' Min. 36,000 Lbs.	2,050' Min. 10,000 Lbs.
High	312	627	835' Min. 25,000 Lbs.	2,990' Min. 7,000 Lbs.

The Petroleum Industry

STOPS RUST!

with

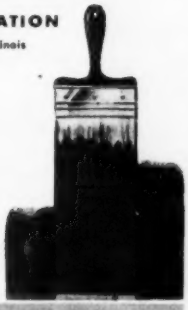
RUST-OLEUM

The Practical Way to Save Pipes, Tanks, Derricks, Buildings, Pumps, Roofs, Fences

Ask the maintenance men who battle rust daily! They'll tell you that RUST-OLEUM is the practical answer. (1) It may be applied directly over surfaces *already rusted* without removing all the rust. Wirebrushing and scraping with sharp scrapers to remove rust scale and loose particles is all that is usually required... eliminating costly sandblasting and chemical pre-cleaning... often enabling one man to do the work of two. (2) RUST-OLEUM *beautifies as it protects in all colors, aluminum, and white.* (3) RUST-OLEUM *stops rust* on every rustable metal surface indoors and out.

See how RUST-OLEUM can cut your maintenance costs. Prompt delivery from Industrial Distributor stocks in principal cities in the United States and Canada.

RUST-OLEUM CORPORATION
2541 Oakton Street • Evanston, Illinois



May be applied directly over rusted surfaces without removing all the rust!
Available in All Colors, Aluminum and White

CLIP THIS TO YOUR LETTERHEAD
MAIL TO: RUST-OLEUM CORPORATION
2541 Oakton Street • Evanston, Illinois

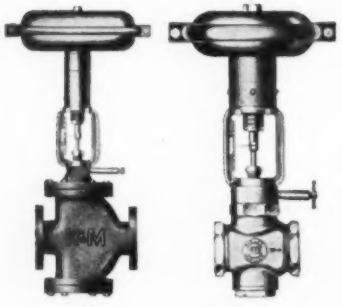
- ☐ Have a Qualified Representative Call
- ☐ Full Details on Free Survey
- ☐ Complete Literature
- ☐ Nearest RUST-OLEUM Source

Why Most Leading Companies Are Using K & M Control Valves

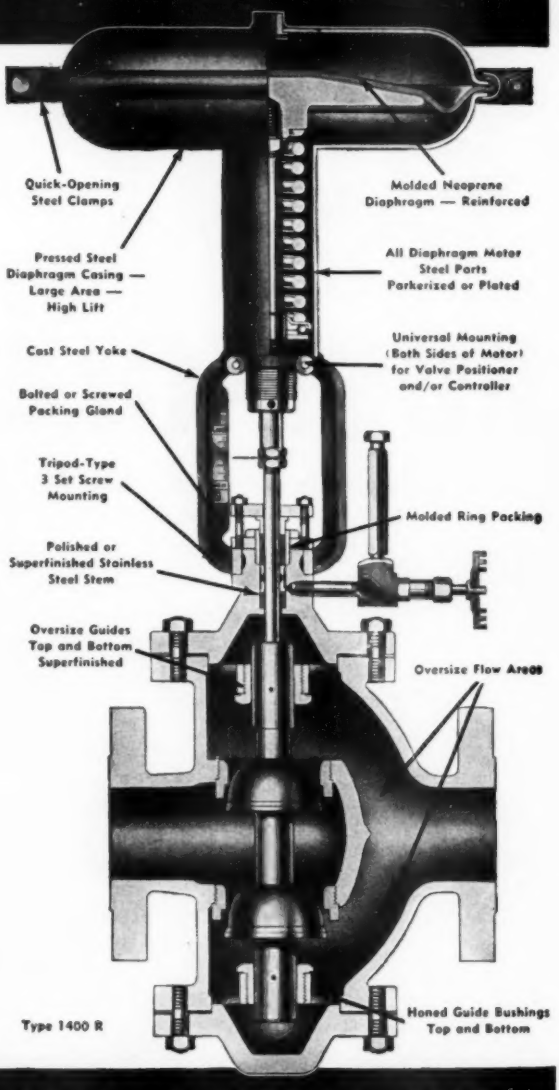
It is logical that leading companies should handle the important subject of control valves as they do other matters: They make use of the best available skills and thinking. More and more, they utilize the equipment, knowledge and facilities of the K & M engineering and service team.

Five years ago, K & M Advanced-Type Control Valves were new to industry. Today, with outstanding performance records behind them, K & M valves have become first in the regard of many instrument engineers. Increasingly, K & M representatives are called upon to give counsel and assistance in the planning of new control installations and the improvement of old ones. During the past year K & M men have been consulted on most of the projects in which control valves have been a major consideration.

There is a qualified K & M representative near you, eager to discuss your problems and able to help you with them.



Type 1200 Type 1000


Quick-Opening Steel Clamps
Molded Neoprene Diaphragm — Reinforced
Pressed Steel Diaphragm Casing — Large Area — High Lift
All Diaphragm Motor Steel Parts Parkerized or Plated
Universal Mounting (Both Sides of Motor) for Valve Positioner and/or Controller
Cast Steel Yoke
Bolted or Screwed Packing Gland
Tripod-Type 3 Set Screw Mounting
Molded Ring Packing
Polished or Superfinished Stainless Steel Stem
Oversize Guides Top and Bottom Superfinished
Oversize Flow Areas
Honed Guide Bushings Top and Bottom

Type 1400 R

K&M

KIELEY & MUELLER, INC.

Valve Makers Since 1879

2017—43rd STREET NORTH BERGEN, N. J.

More and more sales

Monsanto has increased its production of Santodex, the viscosity index improver for lubricating oils. This helps you increase your sales—helps you gain the profit-making advantages of dual grading.

Santodex enables you to:

1. Use lighter viscosity stocks more effectively
2. Meet specifications requiring high viscosity indexes

Santodex in your lubricants gives these benefits to your customers:

1. Easier starting of cold engines at low atmospheric temperatures
2. Greater protection against engine wear at high and low operating temperatures
3. Better piston ring sealing
4. Economical oil consumption

For details and samples of Santodex, write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

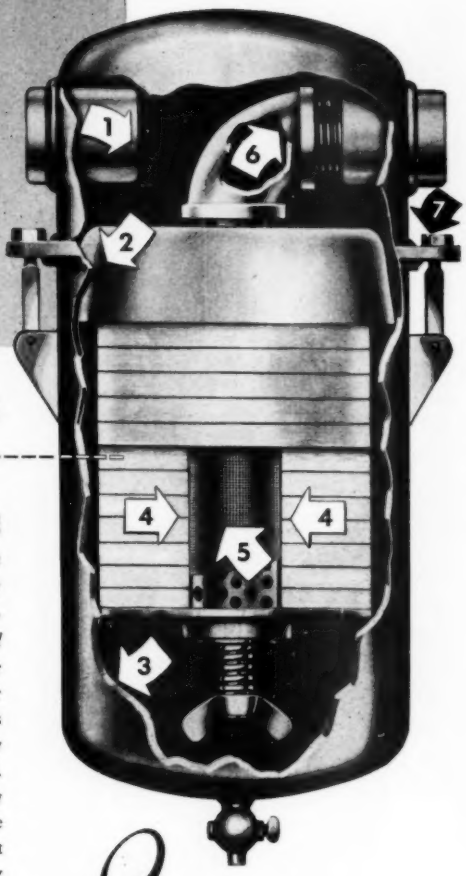
Santodex: Reg. U. S. Pat. Off.

SANTODEX

MONSANTO
CHEMICALS - PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

Removes Last Traces of Oil and Moisture from *COMPRESSED AIR LINES*



THICK FELT DISCS PROVIDE SUPER FILTRATION

DOUBLE ACTION PRINCIPLE REMOVES MOISTURE AND DIRT TWO WAYS—Here's the greatest pipe line filter ever developed for removal of every trace of foreign matter, condensed oil and moisture. Compressed air is cleaned by both *mechanical separation* and *filtration/absorption.* Air entering filter inlet (1) strikes Deflector Cup (2) by which heavier droplets of water and dirt particles are directed to sides of Housing (3) and thence downward at high velocity to base where liquid and heavier particles are deposited. The *mechanically cleaned* air then passes at low velocity thru the Discs (4) which *filter* the air and *absorb* the last traces of oil and moisture. Clean, dry air passes out thru fine mesh Bronze Screen (5) and Outlet (6). Swing Bolts (7) on head for easy inspection are optional.

Originally designed for the protection of pneumatically operated control apparatus, these revolutionary filters are now used as a primary or final stage of filtration for an ever-increasing number of tools, devices and processes. Many highly successful installations are reported in which no other filter had proven satisfactory.

Request Bulletin B-1A, mentioning problem involved for specific engineering information. Please direct your inquiry to Dept. 5.

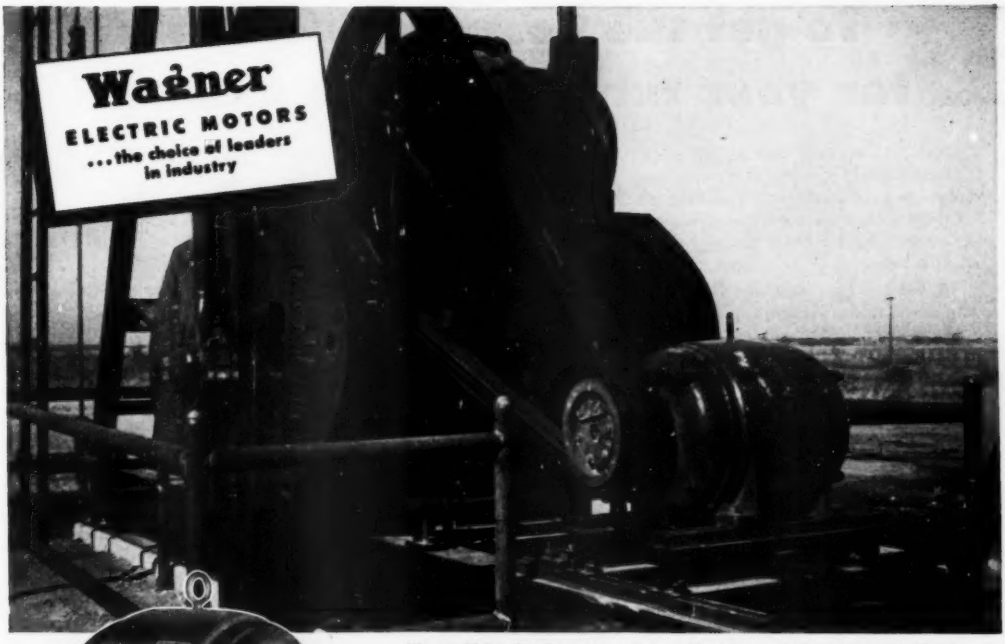
Staynew

ABSORPTION FILTER

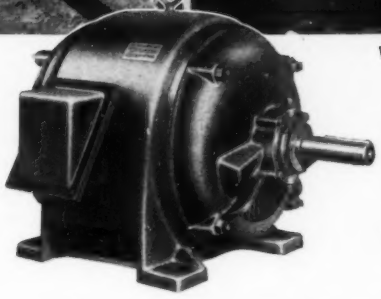
A complete range of sizes available, handling capacities from 5 to 100 CFM free air at 80 lbs. gauge pressure in standard pipe sizes from ¼" to 2". Model illustrated is AAPHS (swing-bolt head). Available also is Model AAPH, identical except for bolted-head construction.

DOLLINGER REG PROTECTOMOTOR U.S. PAT. OFF. STAYNEW FILTERS

DOLLINGER CORPORATION
11 CENTRE PK., ROCHESTER 3, N. Y.



Wagner 25 hp oil well pumping motor, used by a large petroleum company in Texas.



Wagner

OIL WELL PUMPING MOTORS

combine the desirable characteristics of open motors with protection that assures long outdoor life

Wagner polyphase motors for oil well pumping are designed especially for outdoor service. These 40° C motors, with cast iron frames, have double-end ventilation. Sheet steel baffles inside the end-plates direct a cooling air flow around the stator iron and windings, while retarding the entrance of water. Ventilating openings are placed at the bottom of the frame so that any water that may enter the motor will immediately drain out. They have protective coverings to prevent the entrance of small animals and reptiles. Motor windings are specially treated for outdoor service and the cast iron conduit box is moisture-proof and dust tight. These motors are available in ratings through 75 hp and are built in two electrical types: high torque, normal slip; and high torque, high slip.

In addition to these drip-proof motors, the Wagner line includes splash-proof motors, protected against heavy driving rains. For applications requiring single-phase motors, Wagner can furnish capacitor-type motors with the same enclosures. The line also includes totally-enclosed fan-cooled motors in standard or explosion proof types for use in pumping stations and refineries.

Write for Bulletin MU-137 on Oil Well Pumping Motors and Bulletin MU-132 on Totally-Enclosed Cast Iron Motors. Thirty-two branch offices are ready to assist you in any motor application problem.

WAGNER ELECTRIC CORPORATION
6389 Plymouth Ave., St. Louis 14, Mo., U.S.A.

Wagner Electric Corporation EST. WE 1891

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

BRANCHES IN 32 PRINCIPAL CITIES

3438-C

To get the best life/cost ratio for your tubes: Ask the experts!

FINDING several steels that solve your heat, pressure, corrosion and oxidation problems isn't too difficult. But there's only *one* steel that gives you maximum tube life per dollar—the best life/cost ratio.

The Timken Company metallurgists—recognized authorities on high temperature steel—can help you find the one steel that gives you the most for your tube dollar. They are backed by more than 20 years of steel development and have 23 different analyses from which to choose. And whichever of the 23 analyses solves your problem you can be certain of uniform quality. The Timken Company carefully controls quality from melt shop through final inspection.

Our "RSQ"—Research, Supply, Quality—can solve your tube problems. *Ask the experts!* The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

New high temperature steels are born in this 300 lb. furnace at the Timken Company. After our metallurgists formulate the analysis, an experimental heat is made. Tests indicate whether the proposed steel is worthy of further investigations.

This month's report is on: **SICROMO-7**

Suggested as a substitute for steels of the 5.0 per cent chromium type for applications which require increased resistance to corrosion by hot petroleum products.

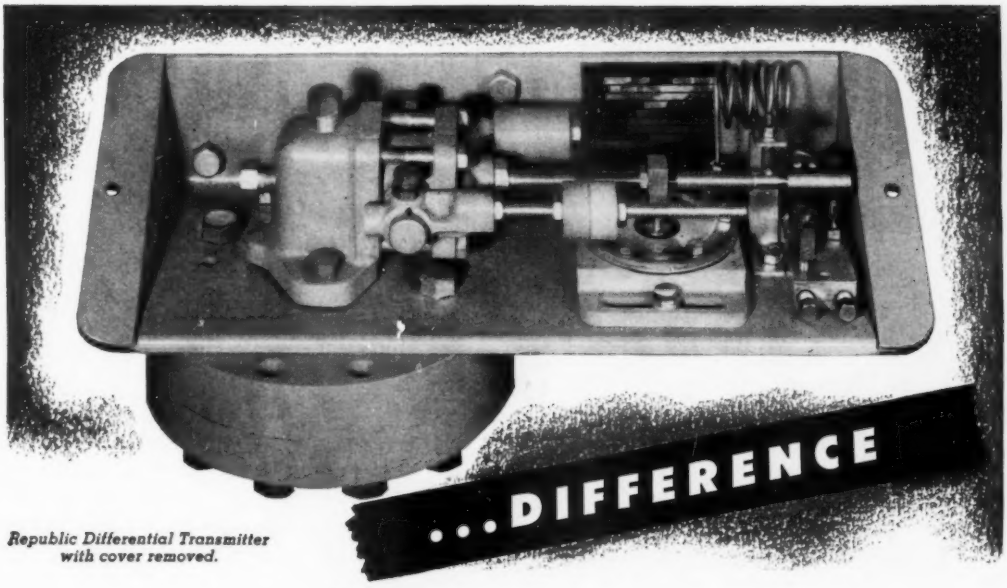
23 TIMKEN® STEELS FOR HIGH TEMPERATURE SERVICE

Carbon	Sicromo 2	Sicromo 5S	16-13-3
Carbon-Mo.	Sicromo 2½	Sicromo 5MS	25-20
DM-2	2¼% Cr.-1% Mo.	Sicromo 7	25-12
Silmo	Sicromo 3	Sicromo 9M	35-15*
DM	4-6% Cr.-Mo.	18-8 Stainless	16-25-6*
2% Cr.-Mo.	4-6% Cr.-Mo.-Ti.	18-8 Cb	

*Not available as seamless tubing at the present time.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.



Republic Differential Transmitter with cover removed.

Spells *PLUS* PERFORMANCE

The Republic Pneumatic Transmitter combines machine ruggedness with instrument precision to provide matchless performance in measuring flow, level, pressure or density of a wide variety fluids. By any or all of the following points, the Republic challenges comparison:

ACCURACY of the Republic force-balance principle is higher than can be consistently secured and maintained with any other method. 1/2 of 1% guaranteed.

TEMPERATURE variations of ambient atmosphere have negligible effect on the accuracy of the Republic transmitter.

CHANGES IN AIR SUPPLY PRESSURE do not affect the accuracy of a Republic transmitter to any significant extent. A 5 psi change produces an error of less than 1/10%.

CHANGES IN LINE PRESSURE—Republic differential transmitters are not affected by variations in line pressure. A patented and exclusive simple adjustment assures this protection.

SENSITIVITY—Due to the negligible motions required for complete operation of all parts, for a full scale change, no appreciable hysteresis results from reversal of direction of measurement change.

VIBRATION of any normal frequency has no effect on the Republic transmitter.

LEVELING—Since all parts are balanced, and no liquid is used for calibration, Republic transmitters need not be leveled exactly, and may be adjusted for installation in any position.

FOR TWELVE YEARS Republic Pneumatic Transmitters have delivered unmatched performance in every type of installation. Complete details of design and operation, plus numerous application suggestions are combined in Data Book, 1002. Send for your copy, today.

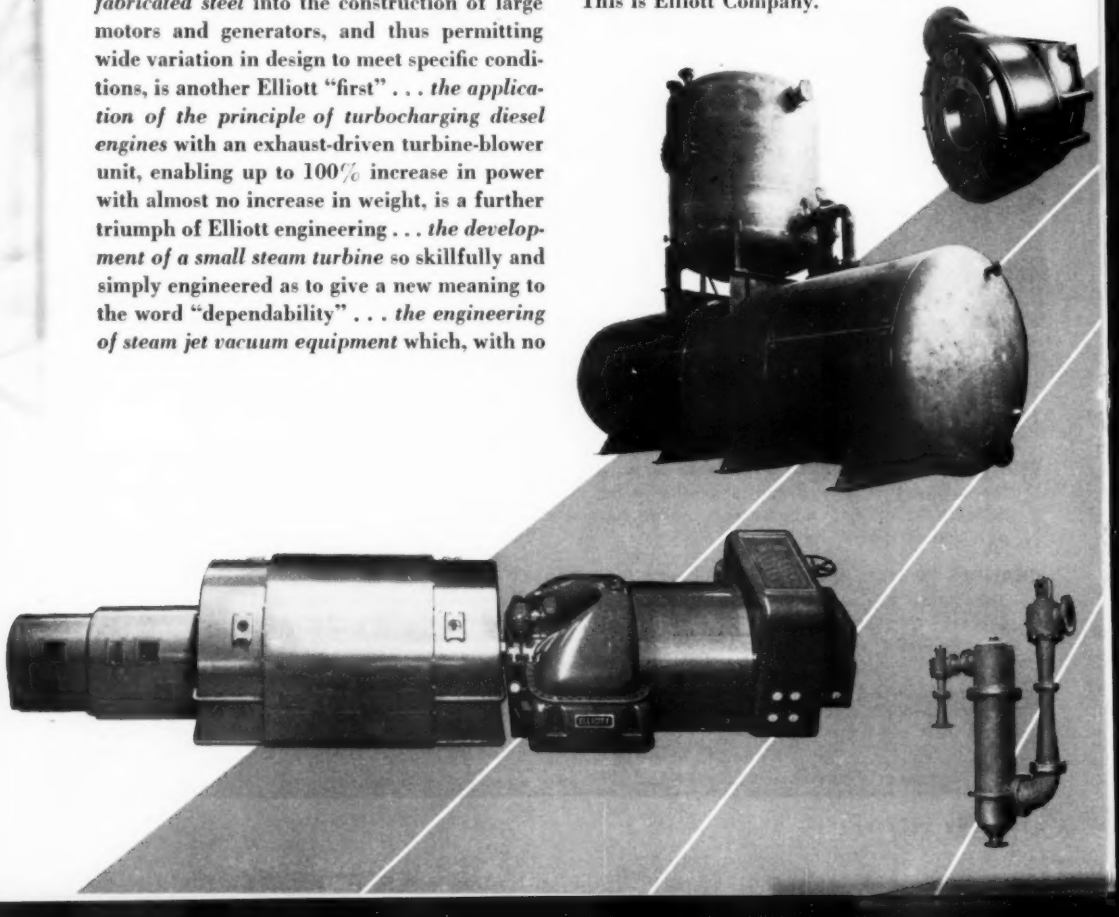
REPUBLIC FLOW METERS CO.

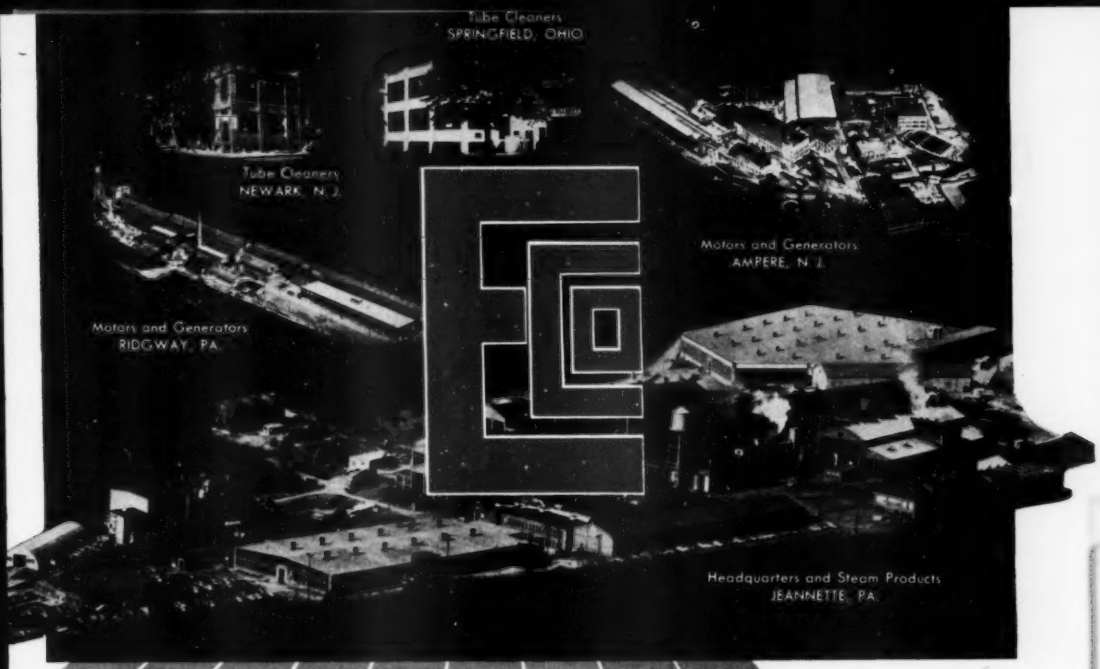
2240 Diversey Parkway, Chicago 47, Illinois

This is ELLIOTT COMPANY

Sparkplug of progress in power generation and the process industries!

WINNING THE WAR WITH CORROSION in steam power systems, was the direct result of Elliott engineers' work in *deaeration*—the removal of rust-causing oxygen from boiler feedwater. Today, Elliott deaerating heaters are protecting power plants everywhere . . . *introducing the crack-proof strength and rigidity of fabricated steel* into the construction of large motors and generators, and thus permitting wide variation in design to meet specific conditions, is another Elliott "first" . . . *the application of the principle of turbocharging diesel engines* with an exhaust-driven turbine-blower unit, enabling up to 100% increase in power with almost no increase in weight, is a further triumph of Elliott engineering . . . *the development of a small steam turbine* so skillfully and simply engineered as to give a new meaning to the word "dependability" . . . *the engineering of steam jet vacuum equipment* which, with no moving parts, produces a new low in commercial absolute pressures . . . all these and more are the contribution of a single organization to America's industrial progress, the combined plants of which total 27 acres of modernly equipped productive area, backed by a nation-wide engineering and service organization. This is Elliott Company.





ELLIOTT Company

JEANNETTE, PA.

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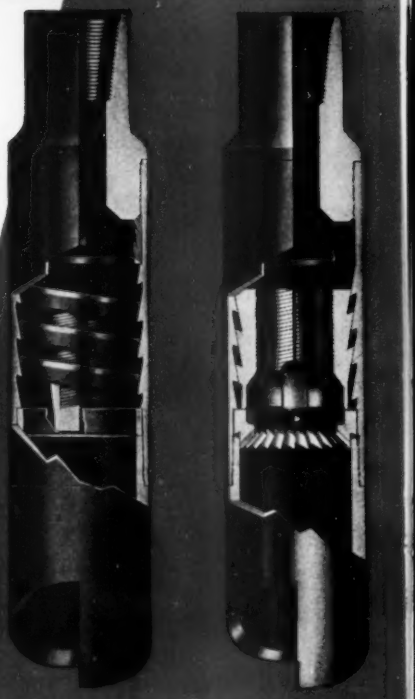
DISTRICT OFFICES IN PRINCIPAL CITIES

G2-1

ESSENTIAL OIL FIELD SPECIALTIES FOR DRILLING FISHING-PRODUCING

In use throughout the world, proved in the field over the years, Bowen Company of Texas tools are a byword for dependability in the Oil Industry.

The two single bowl Overshots pictured are two of the most popular we make. Our catalog lists well over 100 models. This wide selection makes it possible to select a unit for specific requirements.



Series 150
BOWEN OVERSHOT

Single Bowl
ITCO OVERSHOT

BOWEN CO. OF TEXAS

BOWEN-ITCO RELEASING SPEARS

These tools are available in both standard and heavy duty models. While the standard model is really heavy duty in comparison with conventional design, some operators prefer an extra heavy model which is furnished as Bowen's Heavy Duty Model.

FEATURES: Important advantages include its unusual strength; definite assurance of positive engagement with the fish; definite assurance it can be released when desired and then absolute confidence that the fish can be re-engaged after release.

The grapple in the tool is unusually long; it presents a solidly supported gripping area. **The grapple on the standard 2½" Tubing Spear places nearly 50 sq. in. of supported wickered area in contact with the fish.** This permits hard jarring and extremely heavy pulling strains without distorting the fish.

THE HEAVY DUTY MODEL with longer body and grapple presents twice as much supported wickered area in contact with the fish. Heavy duty models are available in all sizes, but only 3" and 3½" are carried in stock. Complete information—catalogs and operating instructions are available on request.

BOWEN CO. OF TEXAS, INC. HOUSTON 1, TEXAS

P. O. BOX 1025 FACTORY AND OFFICE: 2429 CROCKETT ST. PHONE AT wood 4568

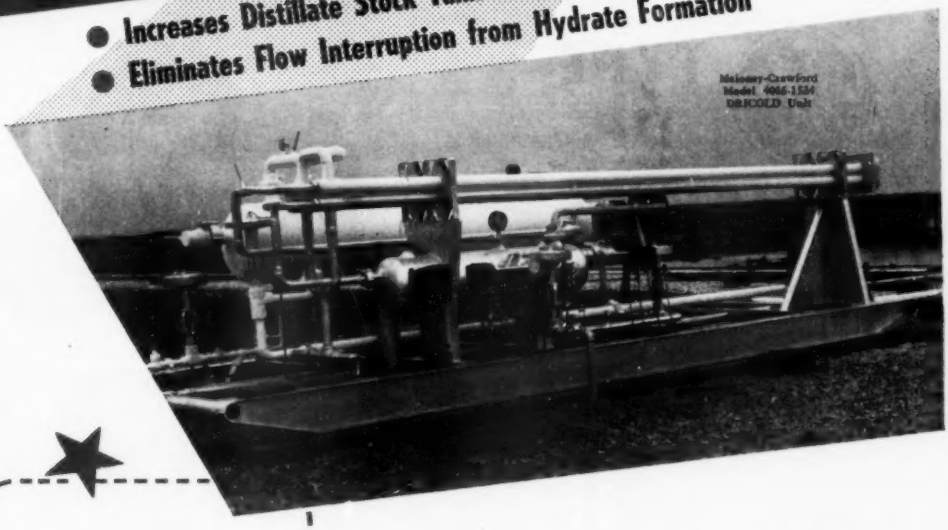
BRANCH WAREHOUSES

Odessa, Texas, 213 North Dixie Blvd., Phone 6-3403; Oklahoma City, Okla., 2810 South High St., Phone 6-8087; Corpus Christi, Texas, 1703 North Port Street, Phone 3-3141; New Iberia, Louisiana, Highway 90, Phone 2096-R; Houma, Louisiana, Magnolia at Barrow St., Phone 6709; Casper, Wyoming, 630 W. Yellowstone, Phone 3108; Farmington, New Mexico, P. O. Box 1073, Phone 757-W.

Now Field Proven

MALONEY-CRAWFORD DRICOLD UNIT

- **Increases Distillate Stock Tank Recovery 5 to 25%**
- **Eliminates Flow Interruption from Hydrate Formation**



STOCKS AND SERVICE AT THESE PRINCIPAL OIL CENTERS

Artesia, N. M.; Corpus Christi, Tex.; Dallas, Tex.; Edmonton, Canada; Farmington, N. M.; Fort Worth, Tex.; Houston, Tex.; Lafayette, La.; Midland, Tex.; New Orleans, La.; Odessa, Tex.; Oklahoma City, Okla.; Pampa, Tex.; San Angelo, Tex.; Snyder, Tex.; Tulsa, Okla.; Wichita Falls, Tex.

Maloney-Crawford's field tested DRICOLD Unit increases distillate stock tank recovery 5 to 25% by successfully using low temperature separation without flow interruption from hydrate formation.

The unit eliminates the need for such drying agents as the glycols and alumina.

If you would like full details on the unit and results of the field tests, write Maloney-Crawford.

MALONEY CRAWFORD

MALONEY-CRAWFORD TANK & MFG. CO.

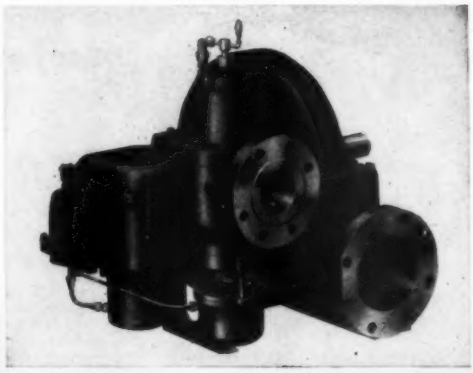
FACTORY AND GENERAL OFFICE: 38 NORTH PEORIA — BOX 659 — TULSA, OKLAHOMA
EXPORT REPRESENTATIVE: Baird Lines, 420 Lexington Avenue, New York, N. Y.
CANADIAN REPRESENTATIVE: Maloney-Crawford of Canada, Ltd., Edmonton, Canada
TEXAS PANHANDLE REPRESENTATIVE: H. W. Waddell, Pampa, Texas

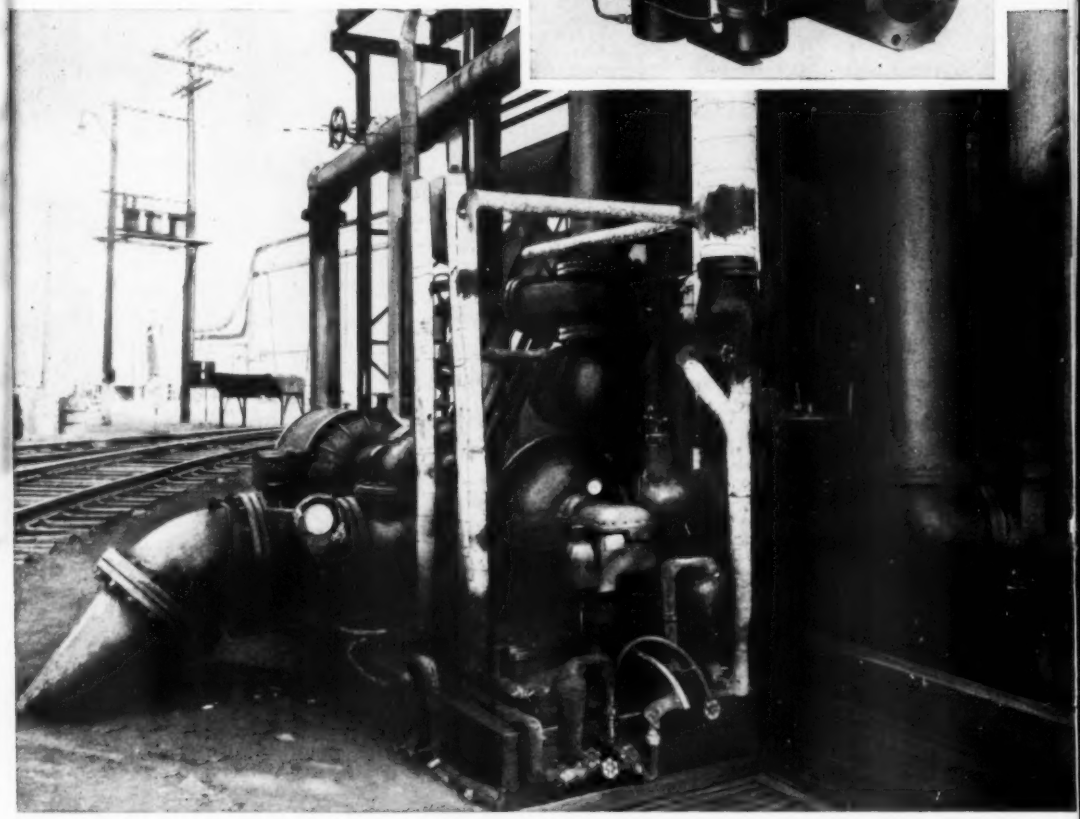
PETROLEUM EQUIPMENT SUPPLIERS ASSOCIATION MEMBER

in turbine drives

Hydraulic Governing

TYPE DP TURBINES





OUTDOOR INSTALLATIONS, such as this one in an oil refinery, are taken in stride by the DP—another advantage of the totally enclosed, hydraulic governing system. Weather conditions and corrosive atmospheres don't bother the sealed-in unit.

DP means Dependable Power

Means Dependability

No part of a mechanical-drive turbine has more to do with day-to-day dependability than the governor. And in most installations, dependability is something that comes ahead of all other considerations—something you're willing to pay a little more to get.

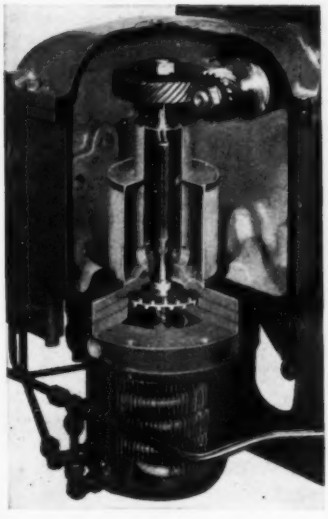
That's why General Electric standardized three years ago on hydraulic governing for its small, mechanical-drive turbines. The Type DP has the same kind of governor that's used with large, utility-type turbines. The operating record of hundreds of DP's in service throughout the country testifies to the soundness of this design.

It eliminates such elements as push rods, thrust bearings, knife-edges, etc., which are subject to wear and maladjustment. The governor operates in a totally enclosed oil atmosphere which protects parts from corrosion and rust.

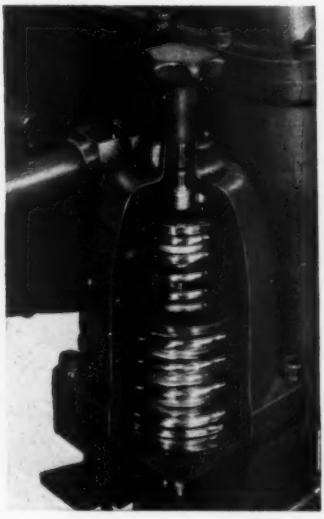
Sometimes, turbines are used as standbys and put in service only at irregular intervals. Hydraulic governing eliminates the possibility of gumming and sticking during long periods of idleness—the DP is ready to go at a moment's notice.

Performance-wise, the DP provides a 30% adjustable speed range—adequate for most applications. If you need more, the Type DR is available with a 5 to 1 speed range. Ask your nearby General Electric sales engineer for complete DP details. *General Electric Company, Schenectady, N. Y.*

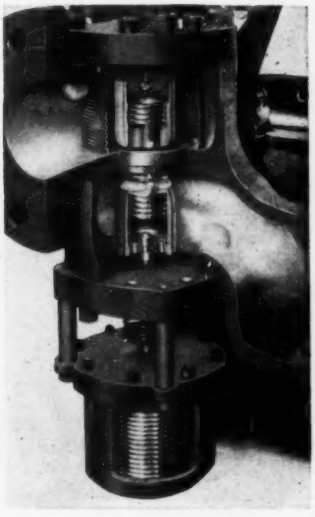
HOW THE DP GOVERNOR OPERATES



This turbine-type oil pump, gear driven from the main shaft, signals any variation in the turbine speed due to changes in load. The pump also provides oil pressure for positioning the governor valve.



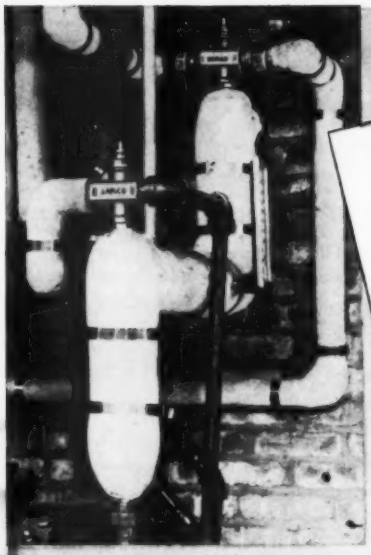
Acting on the speed signal from the oil pump, this pressure relay controls the amount of oil pressure in the operating cylinder. The pressure relay operates automatically after being hand set by the operator.



The operating cylinder, controlled by the relay, opens and closes the governing valve, thus regulating the steam admitted to the turbine. This system almost completely eliminates the need for moving parts.

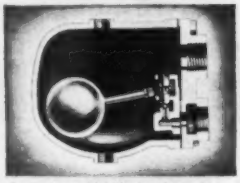
GENERAL ELECTRIC

252-51



Sarco makes simple, self-acting temperature controls assuring the desired Jacket cooling effect with minimum water consumption regardless of load variations.

Sarco type TR-40-L Cooling Control-Jacket water temperatures never too hot or too cold.



Sarco type FA Drain Traps have four pressure ranges to 750 psi. Sizes: ¾" or 1".

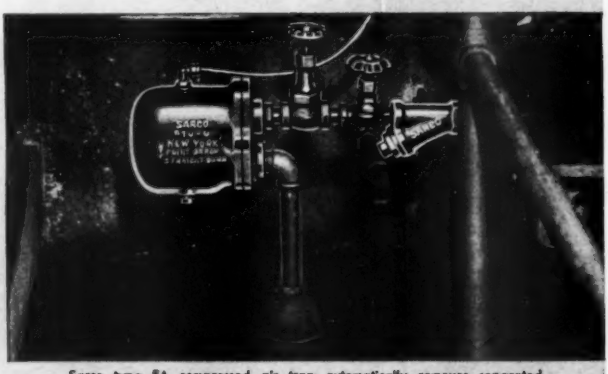
The true measure of effective air compressor capacity is the useful work done by your compressed air.

Measured by this yardstick, many compressor installations are very much oversize for the work they do.

Apart from poorly designed piping, the trouble usually lies in wet air, overcooling, undercooling, choked intake filters, etc. All of these things add up to expensive compressed air and high maintenance costs.

New Technical Bulletin, No. 5-CA, is designed to help users and would-be users of compressed air to get more work from their machines at less cost.

Write for your free copy today.



Sarco type FA compressed air trap automatically removes separated water from the bottom of the receiver. This greatly reduces the possibility of water being carried down the distribution lines to cause trouble in the tools or at the air nozzles. This trap is also used to drain water from separators and the low points of distribution lines.

343

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Represented in Principal Cities
SARCO CANADA LTD., TORONTO 5, ONTARIO

We Haven't Made Them This Big... *YET,*

but this photographic fantasy is simply to remind you that we do manufacture the most varied line of welding elbows on the market.

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PIPING & SUPPLY CO., Inc.

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Same radius as ASA but tangent equal to 25% of nominal pipe size on each end. Saves pipe, layout and welding time. Costs no more than ASA. Sizes to 24".

Dimensions conform to applicable size range of American Standard for Butt-Welding Fittings, ASA B16.9. Tolerances much less than allowable. Sizes to 26".

Recommended where space limitations do not permit use of "Long Tangent" or ASA Elbows. Sizes to 30".

Takes the place of a straight size elbow and a reducer. Eliminates one weld, reduces pressure drop, easier to insulate. Sizes to 12", reductions to half size.

AN INVESTMENT IN EFFICIENCY

Effective dehydration contributes to over-all production efficiency by minimizing difficulties caused by emulsified crudes. Tretolite chemicals and services have been delivering effective dehydration in oil fields everywhere, for many years.

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CORROSION INHIBITING
SCALE PREVENTING • PARAFFIN
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TRETOLITE COMPANY
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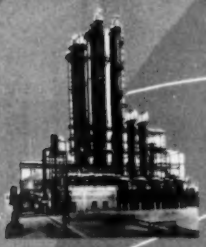
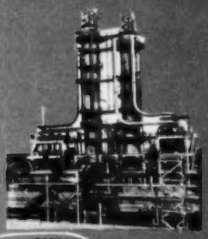
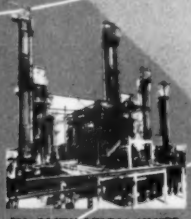


TOLUENE EXTRACTION



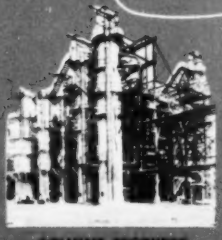
FEED PREPARATION

fractionation



IN ALKYLATION UNITS

SOLVENT NAPHTHA PRODUCTION



SOLVENT RECOVERY

more than 2000 fractionating towers, representing many different processes, have been designed and constructed by Foster Wheeler in over 30 years' service to the worldwide petroleum industry.

FOSTER WHEELER CORPORATION

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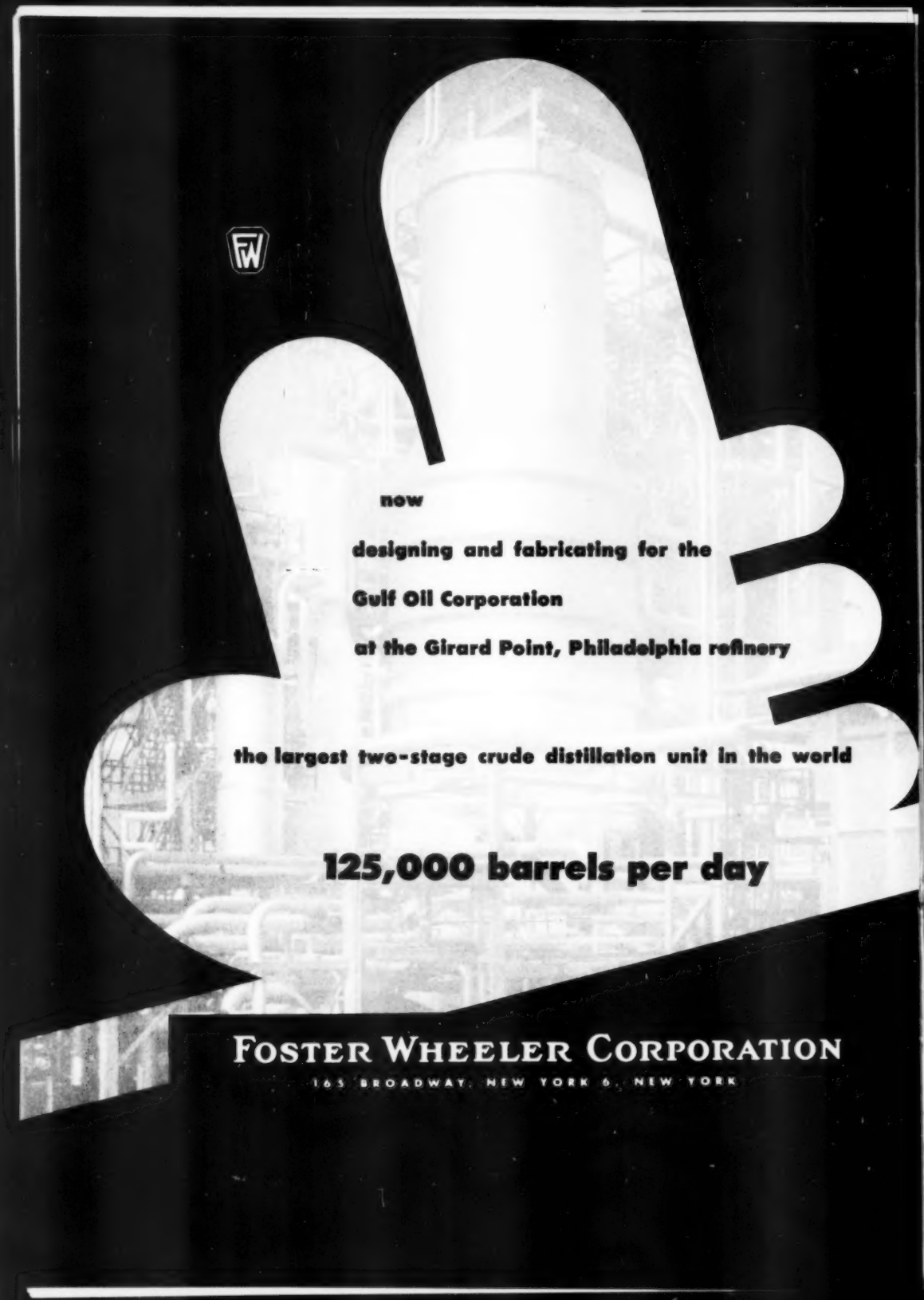
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designing and fabricating for the
Gulf Oil Corporation
at the Girard Point, Philadelphia refinery
the largest two-stage crude distillation unit in the world
125,000 barrels per day
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BJ engineering puts power to work for you...

POWAIRMATIC TUBING TONG

...fast, positive make-up and break-out

Here's how you save when BJ engineering puts *power* to work for you! When you use the BJ Powairmatic Tubing Tong you save on crew time... you increase safety... you get back on production faster!

Speed — the BJ Powairmatic has two power speeds — low gear for breaking out... high gear for fast spinning and make-up.

Accurate Make-Up — the BJ Torque Indicator — an exclusive feature — provides accurate torque readings which insure uniform make-up of the entire string.

Positive Power — permanently lubricated transmission gears power through chain drive to the rotating gripping mechanism... this provides positive grip without crimping.

Ease of Operation — automatic alignment and positioning for stabbing and removal... true-balance suspension... ONE-man operation.

Adaptability — interchangeable jaws and bushings handle tubing sizes from 1¼" to 3½" (4" O.D.)

You'll save crew time on the first stand you break out with this fast, powerful BJ tool. See the BJ Representative in your territory — or write today for new bulletin.

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Endurance and uniformity are added to all Jones Sucker rods by controlled full length normalizing. Forging strains and heat demarcations are removed. Grain structure is refined.

Physicals of Jones nickel alloy rods are improved by both normalizing and tempering.

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ORE DOCK

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FIFTY Raymond CONTRACTS FOR GREAT LAKES STEEL CORPORATION

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The construction of the Ore Dock was the 50th contract between Great Lakes Steel Corporation and Raymond Concrete Pile Company. The work involved the placing of approximately 36,000 cu. yds. of concrete on 7100 long pipe step-taper piles.

WE ARE EXTREMELY PROUD OF THIS RECORD OF SERVICE TO THE GREAT LAKES STEEL CORPORATION

BRANCH OFFICES in the principal cities of the United States and Central and South America.

Raymond CONCRETE PILE CO.

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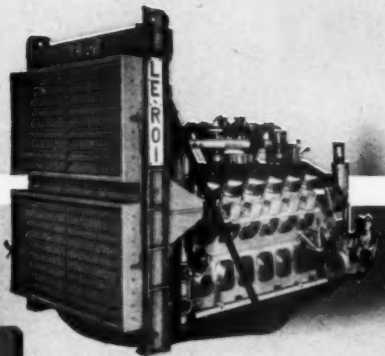
SCOPE OF RAYMOND'S ACTIVITIES
Soil investigations, pile and caisson foundations, underpinning, harbor and river improvements and the lining of steel and concrete pipelines by the Centriline process.

Le Roi 3 way Partnership

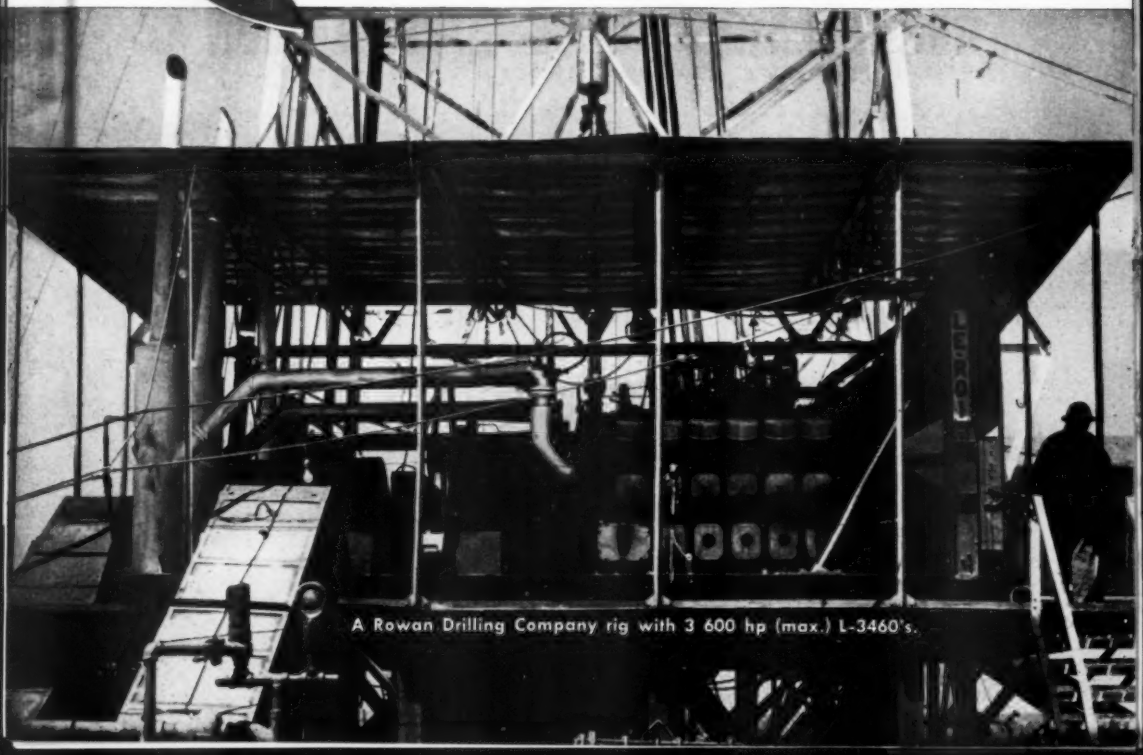


1.

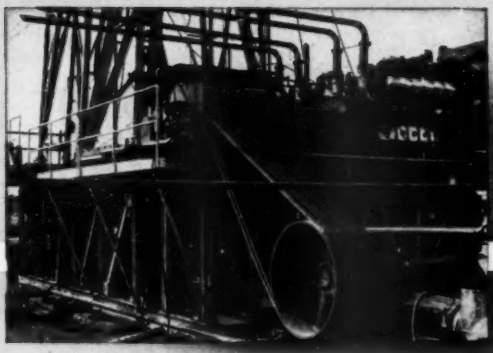
LE ROI gives you Better Engines—for example the L-3460 with its advanced design, V-12 construction and 600 maximum HP — built to meet oil-field demands for more power. Compactness and a weight of only 12,200 pounds give you an extremely low weight-to-horsepower ratio.

600 hp. L3460's put

(MAX.)



A Rowan Drilling Company rig with 3 600 hp (max.) L-3460's.



2. **EXCLUSIVE LE ROI DISTRIBUTORS give you Better Applications**—distributors who sell Le Roi engines are oil-field power specialists. They know engines. That's why they can select the right power unit for any application. That's why you can count on Le Roi for dependable, low-cost power.

3. **YOU get Better Service**—yes, you get personal attention from engine experts when you deal with exclusive Le Roi distributors — because they handle Le Roi, and only Le Roi! Large parts-stocks and skilled mechanics mean prompt service and a minimum of down-time. Remember, keeping your Le Roi engines running is the sole responsibility of our distributors.

you way ahead of the field

...with compactness, more power, greater speed range, greater accessibility

Here's the last word in oil-field engine design — Le Roi's V-12 L3460 with its wide speed range from 600 to 1350 rpm and horsepowers from 350 to 600. It produces plenty of low-cost dependable power for a wide variety of applications — drilling, pipeline service, power generation, etc.

Rowan Drilling Company, for example, uses 10 of these engines on four different rigs. The advantages, of course, for drill-rig applications are: fast acceleration, plenty of lugging power at low speeds, and compactness.

The L3460 is also a standout for pipeline service. It has unusual dependability and economy under continuous load, space-saving size for easy installation, and easy accessibility that simplifies maintenance.

It pays to use L3460's. Not only do you get oil-field power at its best but you also enjoy the benefits of Le Roi's 3-way partnership. See your Le Roi distributor and find out why better engines, sound applications, and prompt personal service put you ahead of the field.

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland • Greenwich, Ohio — Oil Field Headquarters: Tulsa, Oklahoma

LE ROI

See these Le Roi Distributors for a Profitable 3-way Partnership

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Le Roi Company Branch—Tulsa
Carson Machine & Supply Co.—Oklahoma City

East & South Texas, Gulf Coast
Southern Engine and Pump Company — Houston, Kilgore, Edinburg, Dallas, San Antonio, Corpus Christi, Texas, and Lafayette, Houma, Louisiana.

North & West Texas, New Mexico
General Machine & Supply Co. — Odessa, Snyder, Texas.
Hertex Engine & Equipment Co.—Wichita Falls, Texas.

Kansas
Carson Machine and Supply Co.—Great Bend

Illinois — Western Kentucky
Western Machinery & Engine Company—Centralia, Illinois and St. Louis, Missouri.

Typical Le Roi Service Facility

Here's Le Roi's exclusive distributor in Oklahoma—Carson Machine and Supply Company. Centrally located and staffed with plenty of experienced manpower, Carson can give skilled service to any customer in the state within a few hours. Shop facilities are modern and include a dynamometer for testing engines. Complete parts stocks are maintained for all Le Roi engines.

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Gehring Equipment Co. — Casper, Wyoming, Rangeley, Col.

Northern Louisiana & Mississippi
Ingersoll Corporation — Shreveport, Louisiana, and Jackson, Mississippi.

West Coast
Le Roi-Rix Machinery Co. — Los Angeles, Long Beach and Bakersfield, Calif.

Appalachian Area
P. C. McKenzie Co., Pittsburgh, Bradford.

Canada
Lucey Export Ltd. — Calgary, Edmonton, Alberta.

"DOWNTIME-SAVERS"

Condor V-BELTS

You save downtime for belt take-up and belt replacement when you use Condor V-Belts. There are good reasons . . . Condor V-Belts are destretched and balanced by R/M engineering during manufacture . . . and they are made with straight sidewalls for more grip. As a result, each Condor V-Belt in a multiple drive pulls its share of the load without stretching, sagging or slipping. That's why, all Condor V-Belts run longer, save time and money • Bulletin 6868-E, "Grips the Grooves," describes other advantages of the "Smoothest Running V-Belts Made." Write for it, or call your R/M Distributor.

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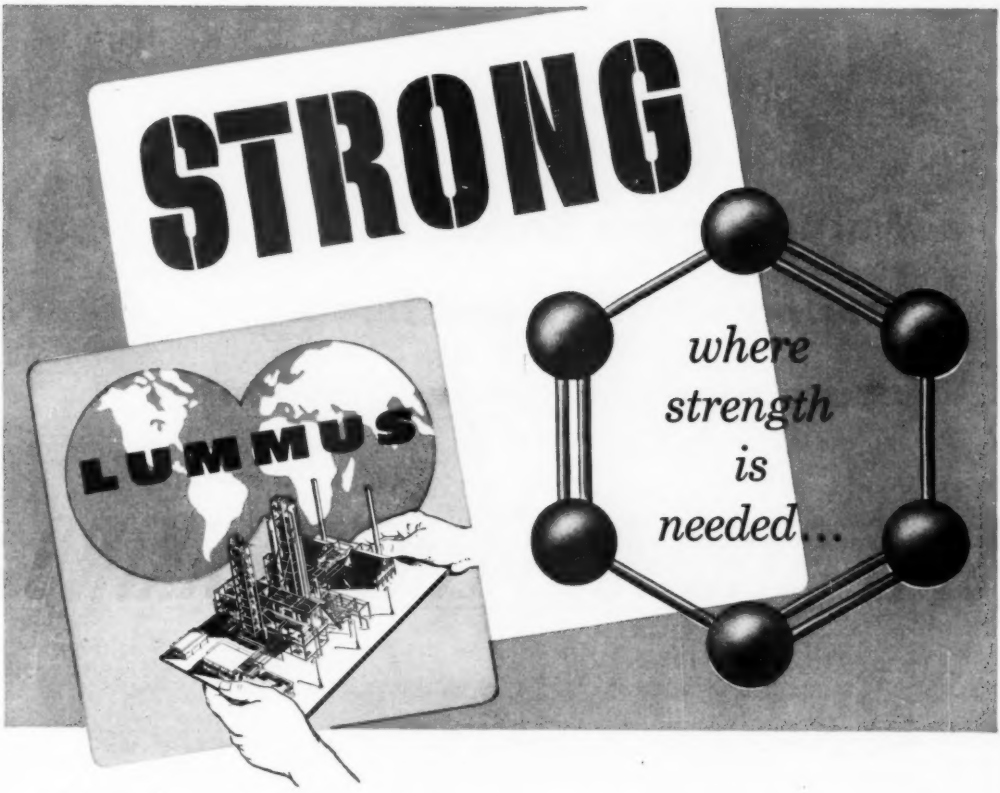
Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts Bowling Balls



The Lummus Company has played an integral and important role in the unfolding story of chemical progress.

Evidence? You'll find it all over the globe in the form of chemical processing units designed, engineered and constructed by The Lummus Company—plants whose initial run met or exceeded design capacity and never relaxed in performance.

Examples? Lummus has designed and built nearly 350 chemical processing units, included among which are plants for producing phenol, resins, solvents, asphalts, alcohol, acetone, toluol, ammonium picrate, and for manufacturing catalysts. We were at the forefront in providing huge styrene and butadiene plants to feed the vast synthetic rubber program. In providing ethylene manufacturing facilities, the name Lummus looms biggest of all.

May we suggest our symbol as a good one to look for, believe in, and rely on in connection with your next chemical processing project? You'll find us to be a group with the depth of chemical engineering talent and the breadth of experience to tackle engineering and construction problems anywhere in the world.

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DESIGNING ENGINEERS AND CONSTRUCTORS FOR THE PETROLEUM AND CHEMICAL INDUSTRIES

Warner Electric Brakes on your pole trailers and floats assure precision synchronization for

SAFE STRAIGHT-LINE BRAKING

When you're hauling pipe, drums, rig parts, and other equipment for the oil fields, you can expect to travel over some mighty rough roads and byways.

That's when you want a braking system that's simple, sure . . . extra safe. That's when you want the kind of precise, *straight-line*, "balanced" braking you get with Warner *Electric* Brakes.

For Warner Electric Brakes give you precise *synchronization* for balanced braking . . . instantaneous, *uniform* braking of *all* wheels on both the tractor and trailer. No time lag in the action. Braking power is applied *instantly* . . . with the speed of electricity.

And no other braking system equals Warner for simplicity. Easy to hook up . . . easy to service. There's *full clearance* under the tractor and trailer . . . nothing exposed to get knocked off or leak. Wherever your floats or pole trailers must go, your Warner brakes will work . . . on the highway, off the highway, out over the fields . . . to bring you a new high in braking safety and service.

OUR 25th YEAR—WARNER ELECTRIC BRAKE & CLUTCH COMPANY, BELOIT, WISCONSIN

WARNER

ELECTRIC BRAKES

FOR TRUCK TRAILERS

HERE'S HOW ELECTRIC

"WARNER WAY" . . . all brakes reach full power together to keep tractor and trailer in line . . . safe, straight-line braking for gradual or emergency stops.

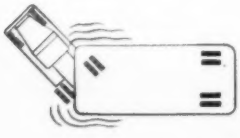
95% of all Shirley Trailers are equipped with Warner Electric Brakes

"A big advantage of Warner *Electric* Brakes is that they make a 'clean' installation with no protruding parts or fittings exposed to be broken or damaged when traveling off highways or on oil leases," says Mr. Owen L. Shirley, owner of Shirley Mfg. Co., Tulsa, Oklahoma.

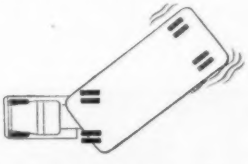
"Other advantages in using Warner *Electric* Brakes are faster application and release of brakes . . . fewer working parts and fittings . . . trailer braking system is separate from the truck system to give two complete, independent braking systems."

Because of these and other outstanding features, Warner *Electric* Brakes are used on 95% of all Shirley trailers for the oil industry.

BRAKES PROTECT AGAINST JACK-KNIFING



WRONG WAY . . . when brakes aren't synchronized and *tractor* brakes "come in" ahead . . . jack-knife is sudden, drive wheels slide sharply. Recovery is difficult.



WRONG WAY . . . when brakes aren't synchronized and *trailer* brakes "build up" first . . . rear of trailer swings, then comes around into a jack-knife.

FREE! **New factual folder "Six Steps to Better Braking for Truck Trailers." Get your copy now.**

Gives important tips on driver safety through synchronized braking. Explains the precise operation, simplicity of hook-up, amazing economy and added safety features of *electric* braking. Write today. Warner Electric Brake & Clutch Company, Dept. OGJ, Beloit, Wisconsin, U. S. A.

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PATENT CHEMICALS SPECIAL PRODUCTS FOR THE PETROLEUM INDUSTRY

FLUORESCENT COLORS, blooming agents for solvent extracted and additive compounded lube oils.

AVIATION GASOLINE DYES . . . the new Petrol "ERO" Blue goes further and meets today's aviation gasoline specifications . . . also available is the original aviation gasoline dye, Petrol PC Blue, which for more than 19 years was the standby coloring agent for aviation gasolines . . . inquiries are invited for the new "ERO" Blue and for the old Petrol PC Blue for coloring aviation gasolines.

"PETROL" COLORS for gasoline, kerosene, diesel and tractor fuels . . . Bronzes, Ambers, Blues, Greens, Golds, Yellows, Purples, Oranges, Reds, Browns, Blacks.

GASOLINE ADDITIVES . . . inhibitors for gasoline, oils, rust . . . high pressure lubricants, stabilizers, emulsifiers, detergents, wetting agents, dispersing agents.

PETROL BLUE WHITENER R and B are used to neutralize undesirable yellow shades in uncolored gasoline or kerosene.

DEBLOOMING AGENT A has the property of neutralizing blooms in lubricating oils.

N. P. A. COLOR has the property of changing body color of pale oils to red cast, without affecting natural fluorescence.

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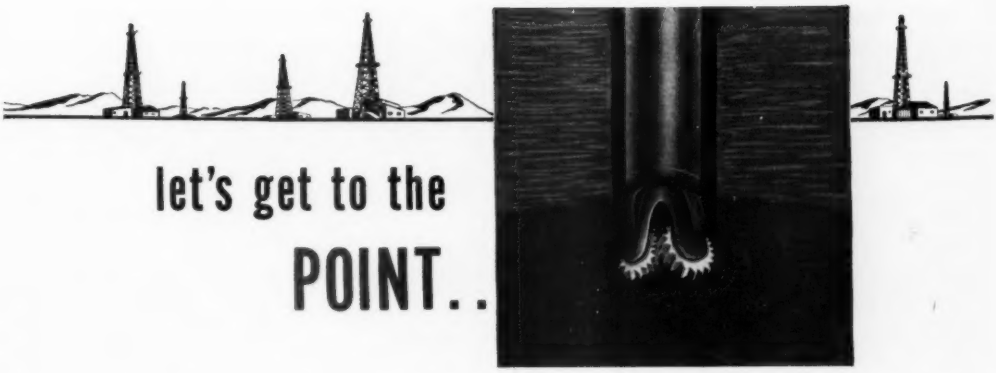
Paterson 4, New Jersey



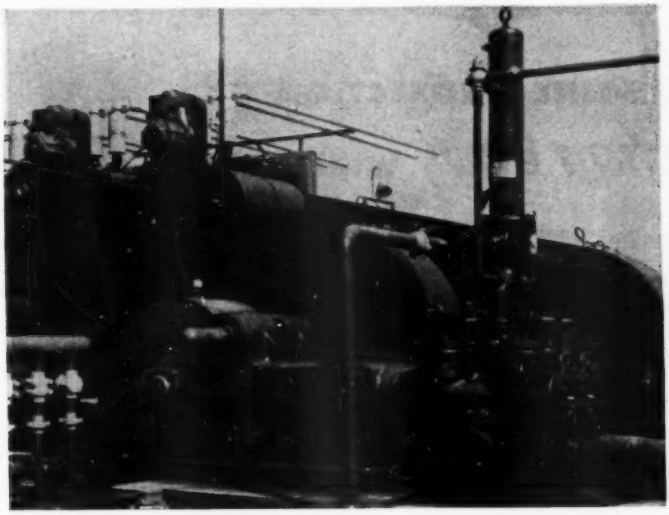
let's get to the POINT..

When your bit breaks into a new formation — whenever you want to send a new mud formula down the drill pipe fast—you'll be thankful for the extra reserve of stamina that's built into your GARDNER-DENVER SLUSH PUMP. Such as—

***Extra rigid main shaft*—solidly mounted in frame—hardened, ground and polished. Eccentric construction permits oversize diameter straight through, gives you a stronger pump.**

***Extra life eccentric bearings*—large areas and low unit pressures carry high plunger loads safely. Flood lubricated with continuous oil bath.**

***Extra heavy herringbone gears*—take sudden overloads safely and efficiently. Jackshaft floats in roller bearings to maintain perfect gear alignment.**



Gardner-Denver Slush Pumps are easily kept in tip-top shape, too!

Divided fluid cylinders simplify replacement—can be field welded.

No connecting rod bolts to keep tight.

One-piece crosshead pin bearing eliminates tricky adjustments.

These and many other features facilitate maintenance in the field.

***Plus:* Gardner-Denver alloy high pressure fluid cylinders, rigid main frame, one-piece connecting rods, foolproof lubrication, positive mud protection, "telltale" liners. Made in NINE sizes, from 15 hp. to 750 hp. Write for complete specifications.**

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

***In Canada:* Gardner-Denver Company (Canada), Ltd., Toronto, Ontario**

Dallas • Houston • Tulsa • St. Louis • Los Angeles • San Francisco • New York • Chicago
Pittsburgh • Denver • New Orleans
Continental Supply Co., Continental Bldg., Dallas, Texas
Export Division: 30 Rockefeller Plaza, New York, N. Y.
Republic Supply Co. (Of Calif.), 2600 S. Eastland Ave., Los Angeles, Calif.

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

OLD . . . Bitumastic Enamel being applied by the "Sling Method."

NEW . . . Bitumastic Enamel being machine-applied.

PIPE-LINE PROTECTION

IS *better than ever* WITH BITUMASTIC!

● BITUMASTIC has a remarkable history of corrosion-prevention, dating back nearly 100 years. And 50 years ago, Bitumastic Enamel "came into its own" for pipe-line protection.

But years ago it wasn't easy to apply protective coatings. For example, the "Sling Method" shown in the photograph on the left was used by many pipeliners. One man poured the hot enamel into the sling; two men "see-sawed" the sling up and down. Naturally this manual method was slow and laborious.

It's a different story today. Pipe lines are cleaned, primed, coated and wrapped mechanically. The coating machine, shown in the photograph on the right, applies Bitumastic quickly and evenly. Bitumastic is a better product, too. Improved formulation makes it easier to handle and apply.

Today, thousands of miles of the world's oil and gas pipe lines are effectively protected against corrosion by Bitumastic Enamel. Get the *same* effective protection by specifying Koppers Bitumastic Enamel for your next pipe-line project.

Why Bitumastic Enamels give lasting protection

Processed from a base of coal-tar pitch, they are impervious to moisture . . . chemically resistant to soil elements. They make a tight bond with the pipe . . . do not disintegrate with age . . . maintain continuously high electrical resistance.

KOPPERS **BITUMASTIC** ENAMELS

REG. U.S. PAT. OFF.

KOPPERS COMPANY, INC., Tar Products Division, Dept. 103-T, Pittsburgh 19, Pa.

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH AND WOODWARD, ALA.

Always the same . . . product quality that never varies . . . that's the secret of Aeroquip's leadership. Nothing is spared in time, money and effort to obtain the newest, most accurate inspection equipment to assure the Aeroquip standard, highest in the industry. That is why Aeroquip Products are "Always First" in quality.

- Flexible Hose Lines
- Detachable, Reusable Fittings
- Self-Sealing Couplings
- Breakaway Couplings

Aeroquip

REG. TRADE MARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA. MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

GM DIESEL
Case History No. 514-28

USER: C. E. Brehm Drilling Co.,
Mt. Vernon, Illinois

INSTALLATION: Two General Motors Diesel Twin 6's driving Brewster N4 drawworks and Emsco A10 Triplex pump

PERFORMANCE: Engines drilled 258,000 feet of hole in 33 months without an overhaul--still performing 100%. Rig easy to move with engines intact--has moved one mile and set up again in 6 hours. Low fuel and maintenance costs.

This Diesel drilled a quarter-million feet

without overhaul

"GM Diesels are tops," says L. L. Hall, drilling superintendent. "These engines cut our drilling costs way down and cut our costs another third." Postwar-designed GM 2-cycle Diesels pack more power in less space, which means fewer units, easier moves and fewer round trips. With most parts interchangeable and easy to replace, GM Diesels take less time out for servicing, and less to maintain. Check it with other contractors—prove it for yourself by specifying GM Diesel engines on the next rig you buy or repower.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS, DETROIT 28, MICHIGAN

It pays to Standardize on

GM
DIESEL
POWER

Solving special friction problems is an everyday job with Torrington. Designing and producing made-to-order bearings has been an important part of our business for years.

This extensive experience has included all types of anti-friction bearings . . . both small and large . . . and for use in virtually every type of equipment. Result: Torrington can give you an impartial recommendation tailored to *your* application.

Whether you are a builder or user of machinery requiring bearings, Torrington engineers will gladly work with you in selecting a standard—or designing a special bearing tailored to your needs.

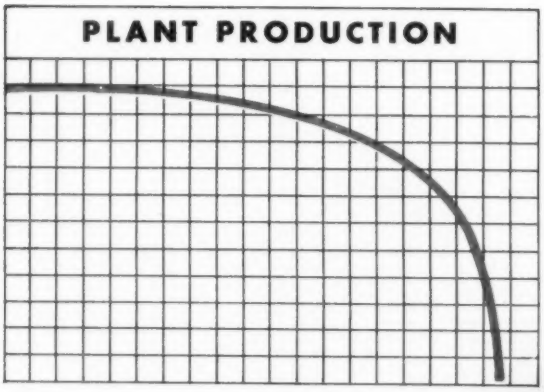
THE TORRINGTON COMPANY

South Bend 21, Ind. Torrington, Conn.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

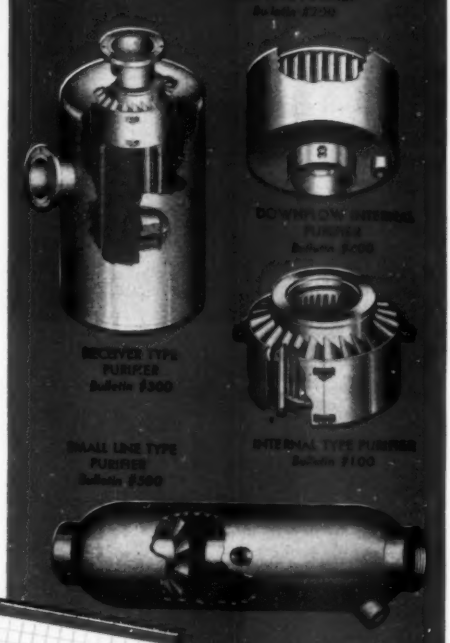


Say Goodbye to

Guck and Downtime Problems

Eventually guck in your pipelines and equipment handling steam, vapor, compressed air or gases, will result in downtime . . . costing your plant thousands of dollars! How would you like to bring an end, *once and for all,* to shutdowns caused by guck and other pipeline nuisances. Then investigate using Hi-eF Purifiers to protect pipelines against guck, sludge, oil, line scale and other objectionable entrainment. With Hi-eF Purifiers there is no entrainment to damage, clog up or retard the efficiency of equipment. In exhaust steam and vapor applications Hi-eF Purifiers remove damaging oil and acids which attack machinery and buildings when vented to the air . . . or make exhaust steam so objectionable it cannot be reclaimed.

Perhaps you have already ruled out purifiers because of their high cost. You're in for a surprise, then, for Hi-eF Purifiers are as economical as an ordinary separator . . . yet *guaranteed to remove 99% of all entrainment.* Tell us about your guck problem today. Our engineering staff, daily assisting leading manufacturers in entrainment problems, will recommend the proper solution.



PURIFIER DIVISION,
THE V. D. ANDERSON COMPANY
1992 West 96th Street • Cleveland 2, Ohio

Gentlemen: Please send additional information on Anderson Hi-eF Purifiers described in:

☐ Bulletin #100 ☐ Bulletin #300 ☐ Bulletin #500
☐ Bulletin #200 ☐ Bulletin #400

Name .....
Company .....
Address .....
City ..... Zone ... State .....

Compare-

STURDYBILT with ANY Type of Field Housing

Look What STURDYBILT Gives You!

- **DESIGN**
  That "custom-built" look and expensive house comfort.
- **PORTABILITY**
  Moved to your site . . . erected in days instead of weeks.
- **DEMOUNTABILITY**
  Take houses with you when you move. Practically no loss of material.

MANUFACTURERS OF SPECIAL MILLWORK: DISTRIBUTORS OF JOHNS-MANVILLE BUILDING MATERIALS; CURTIS WOODWORK.

When you need field housing you need it quickly. You also want low cost housing that is attractive to workers' families and comfortable for year 'round living.

STURDYBILT gives you these features *plus* portability.

When you buy oil field housing compare any other type of housing with the STURDYBILT plan. You'll find you can't beat STURDYBILT for speed of erection . . . durability . . . portability . . . attractiveness or comfort.

STURDYBILT

PREFABRICATED, DEMOUNTABLE HOUSES

SOUTHERN MILL & MANUFACTURING CO. • TULSA, OKLAHOMA

STURDYBILT HOUSES COMPLY WITH COMMERCIAL STANDARD CS125 OF THE NATIONAL BUREAU OF STANDARDS FOR PREFABRICATED HOMES

For Top Flight Gas Welding

Choose from AIRCO'S complete line of Oxyacetylene Welding Supplies

Time Proved . . . Job Tested . . . Money Saving

Available from Local Stocks

That's right! Whether you use a popular Airco gas welding rod, flux, or brazing alloy for production or maintenance operations . . . you're certain of top-notch work—ask any one of the thousands of welders who swear by these Airco oxyacetylene welding supplies.

This well-recognized reputation for top performance didn't just happen—more than thirty years' experience and development have gone into the manufacture of these outstanding gas welding supplies . . . know-how that produces high quality, reasonably-priced items that guarantee a job done faster, done better, done easier and done at less net cost.

For further information about Airco's oxyacetylene welding supplies which includes a complete line of rods, fluxes and brazing alloys, write your nearest Airco Office or Authorized Dealer for a free copy of Catalog 12.

More news about AIRCO products

AIRCO No. 1 ALLOY STEEL
A Smooth-Flowing, High Ductile Rod Insuring Good Control of Molten Pool

This rod (AWS Classification GA60) is ideal for welding low carbon and low alloy steels, including pipe of grades A and B analysis. Outstanding among its many important features is the high ductility in the "as welded" condition. Because of its mechanical properties, this rod is desirable when undertaking qualification tests like those included in The American Standards Association Code for Pressure Piping. It is smooth flowing, insuring good control of the molten pool, and, in addition, will withstand considerable heating without burning.

PHOS COPPER
A High Standard Copper And Phosphorous Brazing Alloy

It is self-fluxing when used on copper-to-copper joints but requires a good low melting point flux when brazing brass, bronze or other alloys. It is completely fluid at approximately 1382°F. at which temperature best results are secured and is used in the manufacture of electrical, refrigeration and air conditioning equipment. Available in rod and strip form.

AIRCO MARVEL BRAZING FLUX
A High Quality Flux That Remains Molten And Viscous Over A Wide Temperature Range

It is a uniformly high-quality flux for use in braze welding cast iron, malleable iron, copper and steel and for welding brass, bronze and copper. Marvel Flux remains molten and viscous over a wide temperature range. Its use protects the weld metal from oxidation and effectively reduces or removes oxides and other foreign matter. Marvel Flux is a general purpose flux for the welding shop.

AIR REDUCTION MAGNOLIA COMPANY

A Division of Air Reduction Company, Incorporated

Beaumont • Corpus Christi • Dallas • El Paso
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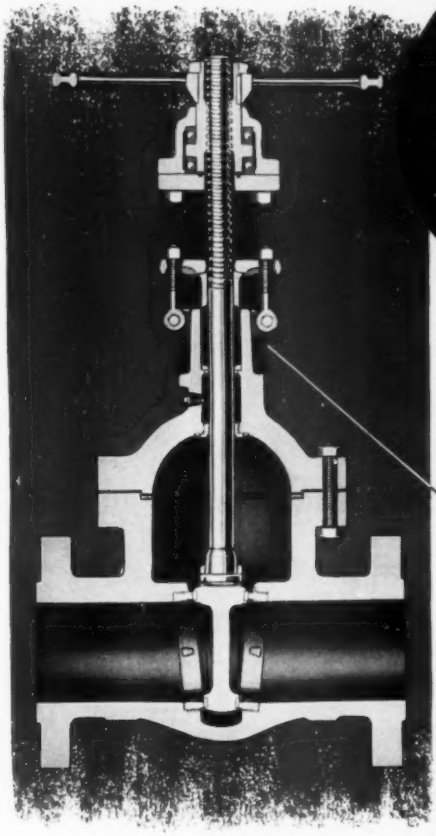
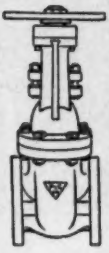
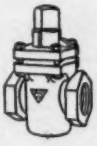
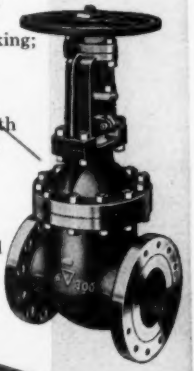
You'll benefit by using

R·P&C
CAST STEEL VALVES



Note the **quality features** of this Gate Valve. They are typical of all valves in the R-P&C Cast Steel Line—gate, globe, angle and check valves in pressure classes 150 lb. through 2500 lb.

- **Ball Bearing Operating Nut** permits smooth operation with minimum effort.
- **One Piece Yoke with Cap** provides rigidity, perfect alignment and easy access to operating nut.
- **High Quality Packing** assures a tight stuffing box under all conditions—low stem friction—minimum servicing.
- **Gland and Follower with Ball Joint** applies uniform pressure on packing, prevents follower binding with stem.
- **Heat-treated Stainless Steel Stem** has high strength and corrosion resistance. Polished surface increases life of packing; T-head makes strong, self-aligning connection with wedge.
- **Solid I-Beam Wedge** is guided to proper seating by guide ribs cast integral with the body. Wedge seating surfaces are precision ground to fit perfectly with body seat rings.
- **Barrel-type Seat Rings** have heavy, uniform section; offer no points of high stress concentration; have broad seating surface, ground smooth for less wear—longer life. Port opening is full pipe diameter.

***In addition** to the standard line, R-P&C offers cast steel gate and globe valves with Pressure Sealed Bonnet joint—especially adapted for high pressure, high temperature service. For information, get in touch with your nearest R-P&C District Office.*

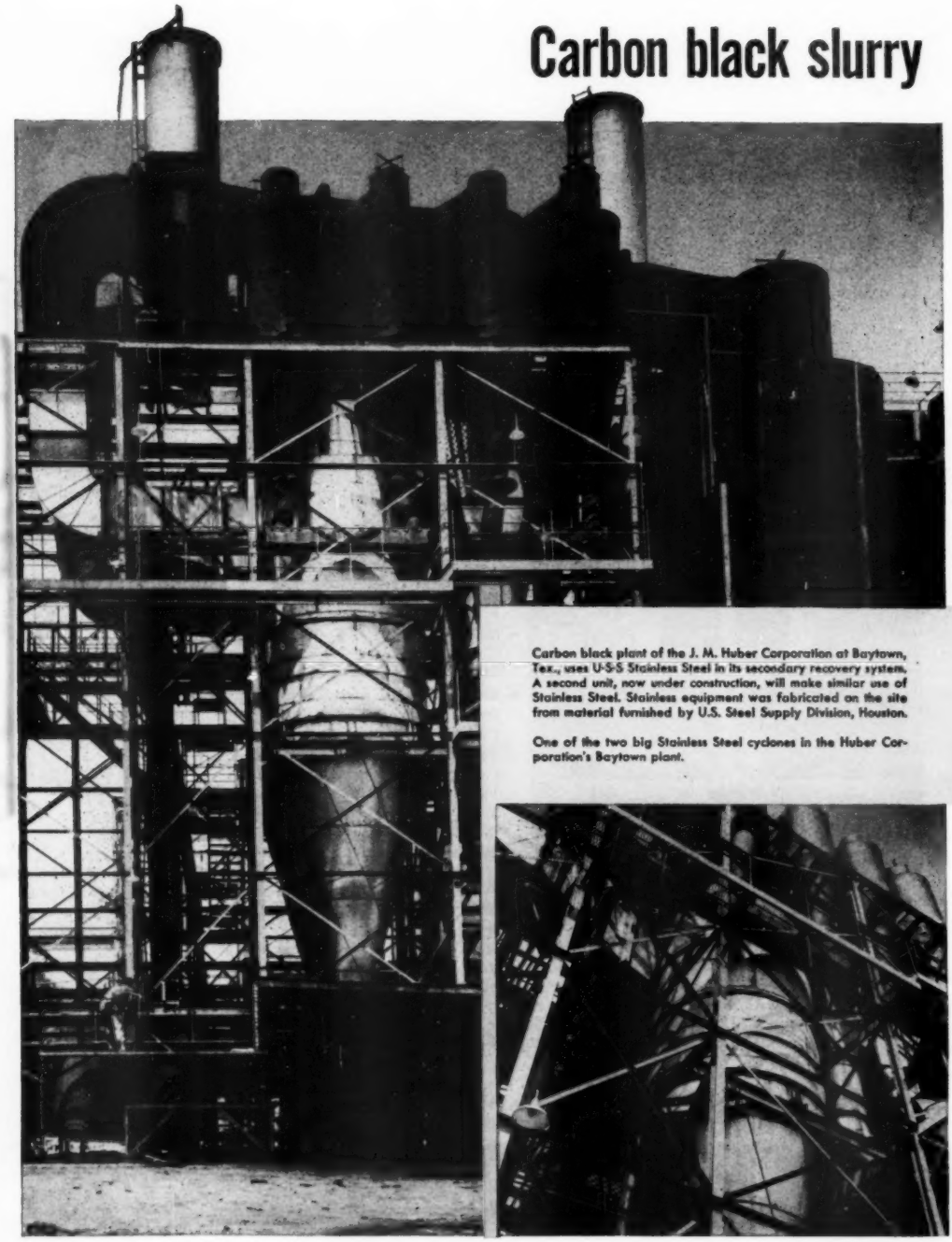
ACCO Reading, Pa., Atlanta, Baltimore, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Connecticut

R-P & C VALVE DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

READING-PRATT & CADY VALVES

Carbon black slurry



Carbon black plant of the J. M. Huber Corporation at Baytown, Tex., uses U-S-S Stainless Steel in its secondary recovery system. A second unit, now under construction, will make similar use of Stainless Steel. Stainless equipment was fabricated on the site from material furnished by U.S. Steel Supply Division, Houston.

One of the two big Stainless Steel cyclones in the Huber Corporation's Baytown plant.

gives equipment the acid test ... and only Stainless Steel survives!

ONE GLANCE at this section of piping tells you why Stainless Steel was a must for the secondary recovery system in J. M. Huber Corporation's carbon black plant at Baytown, Texas. After only three weeks of service, the non-Stainless portion is completely eaten through, while the part made of Stainless Steel is relatively unaffected by the extreme corrosion.

In order to get maximum recovery of the carbon black produced in converters at this plant, the Huber Corporation installed a secondary recovery system. The secondary system includes dry and wet recovery, and it's in the wet end where corrosion takes its heaviest toll.

After only three weeks in service, the non-Stainless portion of this piping has been completely ruined by corrosive carbon black slurry, while the Stainless Steel section remains in good condition.

The Huber Corporation tested many types of materials, plus many different kinds of coatings, before selecting U·S·S Stainless Steel for wet recovery. Stainless Steel was used for the two cyclones—each 12 feet in diameter and 42 feet high—for the sprays inside the cyclones and the piping through which the corrosive slurry passes.

In this application, U·S·S Stainless Steel is subjected to sulfuric acid, carbonic acid and other acids. Temperatures range up to 180°. Stainless Steel is standing up under these conditions where other materials failed after two or three weeks' service at the most.

The severe service conditions under which chemical processing equipment operates often preclude the use of anything but Stainless Steel. Stainless Steel's resistance to high temperatures and extremely corrosive conditions, its strength with light weight and its freedom from product contamination mean long equipment life with less maintenance and less frequent replacement.

Some grades of Stainless Steel are in limited supply today, but essential needs are being filled. For finest performance, insist that your fabricator use perfected, service-tested U·S·S Stainless Steel.

U·S·S STAINLESS STEEL

2-113

USS UNITED STATES STEEL COMPANY

AMERICAN STEEL & WIRE .... COLUMBIA-GENEVA STEEL .... NATIONAL TUBE .... TENNESSEE COAL & IRON
UNITED STATES STEEL SUPPLY, WAREHOUSE DISTRIBUTORS .... Divisions of UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

MID-CONTINENT STATES of *SURE SUPPLY...*

...SURE QUALITY
...SURE SERVICE!

The greatest oil reservoirs in the country are located in the Mid-Continent States of Sure Supply — and strategically placed, fully stocked Mid-Continent stores are reservoirs of quality products and prompt, experienced service in this great oil producing area.

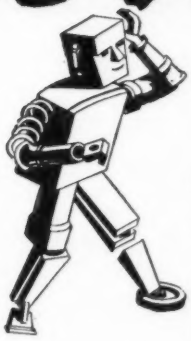
Topped by the famous oil-spouting, blue-neon derrick — the Mid-Continent store stands as a symbol of "Around-the-Clock" service wherever and whenever needed. Oil men know they will find personnel with facilities and "know how" to save them time and money when they stop under the blue neon derrick. Make Mid-Continent your SURE SUPPLY headquarters too!

MID-CONTINENT
Supply Company

General Offices, Mid-Continent Building **FORT WORTH, TEXAS**

THE WORLD'S LARGEST INDEPENDENT OIL FIELD SUPPLY COMPANY

STEEL SCRAP is VERY SCARCE



America's steel industry is essential to the nation's defense.

Large quantities of scrap are used by the steel industry.

YOU—in your plant or on your property have scrap that's urgently needed.

Unless you turn your scrap over to your scrap dealer, the steel so vital to American industry cannot be made.

GET YOUR SCRAP MOVING...TODAY

Wire Rope—sinewy muscle of industry—is one more of the many products of steel upon which America depends for the increased production necessary to meet both civilian and defense demands.

Here, too, your scrap contribution is of vital importance... enabling us to serve you better... helping to provide you with continued, uninterrupted supply.

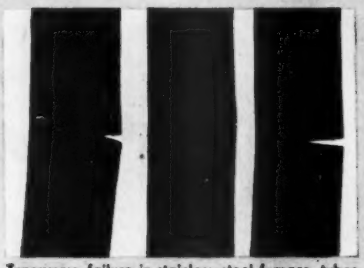
THE CALIFORNIA WIRE CLOTH CORP.— Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
THE COLORADO FUEL & IRON CORP.— Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
WICKWIRE SPENCER STEEL DIV.— Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) Philadelphia • New York

LOOK FOR THE YELLOW TRIANGLE ON THE REEL

WICKWIRE ROPE

CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL & IRON CORPORATION

let's take a CLOSER LOOK at CAUSES OF TUBE FAILURES



Transverse failure in stainless steel furnace tubes due to bending stresses from improper support combined with excessive overheating and badly carburized conditions.

Tubes are critical materials. Peak production of petroleum products is vital to the defense program. These are two urgent reasons for giving extraordinary attention *now* to getting optimum failure-free service from tube installations in petro-chemical facilities.

Of major importance in securing best operating results is an understanding of the numerous factors affecting tube life in high pressure, high temperature applications. Innumerable investigations of tube failures in such service over a 25-year period show that they are most frequently caused by circumstances other than actual physical defects in the tubes themselves. By far the most common causes of failures are overheating, excessive pressures, corrosion, and scaling due to tubes being subjected to improper operating conditions.

On the opposite page are enumerated some of the more prevalent reasons, based on extensive studies, that account for excessive tube temperatures and attendant failures in petroleum conversion equipment. These are presented in the hope they will aid engineers and operating personnel to get better-than-ever service from their tube installations.

Through Mr. Tubes—your local B&W Tube Representative—is available a wealth of data on the behavior of tubing steels under conditions embraced in modern processing plants. It may pay you as it has so many others to call on this vast source of useful information.

Some Common Causes of Reduced Tube Life and Increased Maintenance

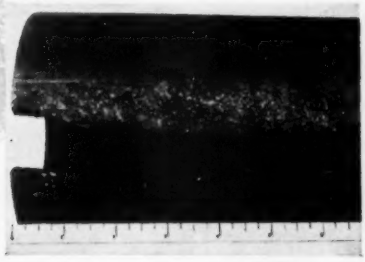
1. Excessive transfer rates in furnace equipment.
2. Coking of tubes – either expected or extraordinary.
3. Failure to clean tubes at regularly scheduled periods.
4. Unexpected radiation from bridge wall or refractory surfaces.
5. Improperly calibrated fuel meters on burner equipment.
6. Increase of product temperature over a safe design limit.
7. Unequal heating around circumference or along tube length.
8. Excessive furnace temperatures.
9. Guessing at tube metal temperatures.
10. Increase of pump pressure of maintain through-put.
11. Abuse during mechanical decoking, or scaling during burningout operations.
12. Improper supports resulting in bending or sagging.
13. Lack of control of furnace atmosphere to retard scaling.
14. Corrosion of ends or body of tube or both.
15. Carburization and exfoliation of carburized layer.
16. Abrasion or erosion due to coke in fluid stream.
17. Leaky header seats.

Stress-rupture failure in carbon steel still tube due to overheating.

Bulletin TR-516 entitled "Some Experiences in Service", contains more detailed information on this timely subject, and is available upon request.

Sections of carbon steel tube (top) and chrome-moly steel tube (bottom) which failed due to stress-rupture and oxidation under excessive temperature conditions.

Excessive coke formation caused overheating and rupture in this 18-8 stainless steel still tube under high pressure.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing
Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 2, Texas • Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y. Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA 1652-S

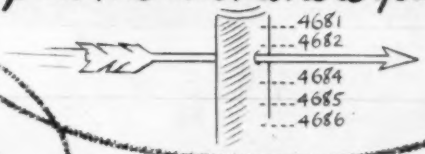
MAXIMUM PRODUCTION *is gained by*

Deep Penetration

+

Depth Measure Accuracy

that puts the shot where you want it



+

Fast Safe Operation

That's Lane-Wells KONE SHOT PLUS VALUE perforating

ASK YOUR LANE-WELLS MAN!

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5610 So. Soto St., Los Angeles 58, California

Los Angeles • Houston • Oklahoma City
• Lane-Wells Canadian Co. in Canada
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AK 501

LANE WELLS

Tomorrow's Tools – Today!

STATEMENT OF CONDITION

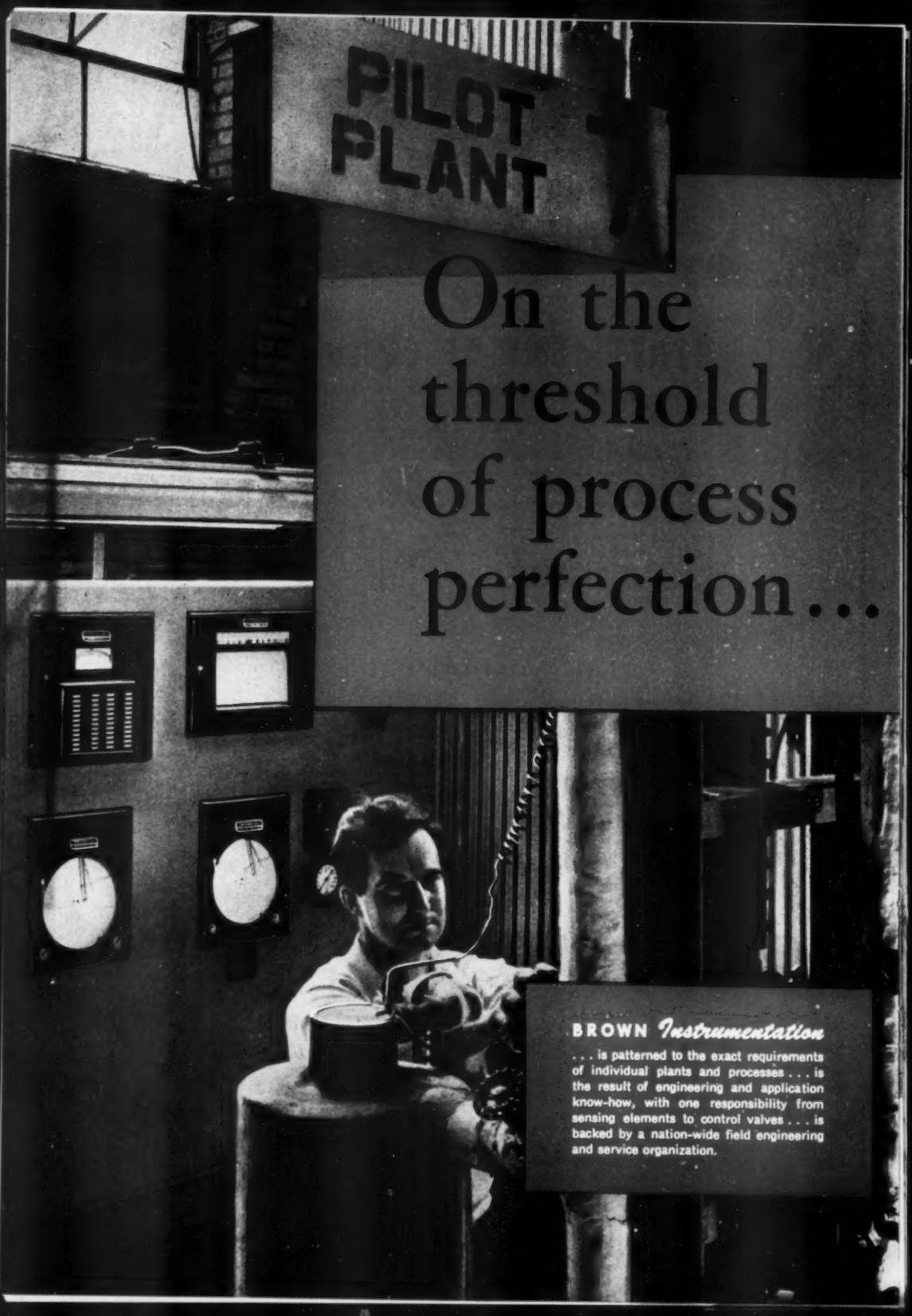
at the close of business December 31, 1951

ASSETS

Cash on Hand and Due from Banks	$210,215,820.03
United States Securities Owned	121,274,575.20
State, County and Municipal Bonds	11,512,534.63
Stock in Federal Reserve Bank	720,000.00
Other Bonds	73,100.00
Loans and Discounts	194,758,349.94
Income Accrued	995,325.33
Letters of Credit and Acceptances	8,897,444.25
Banking House and Equipment	3,841,393.55
Other Assets	28,001.00
	$552,316,543.93

LIABILITIES

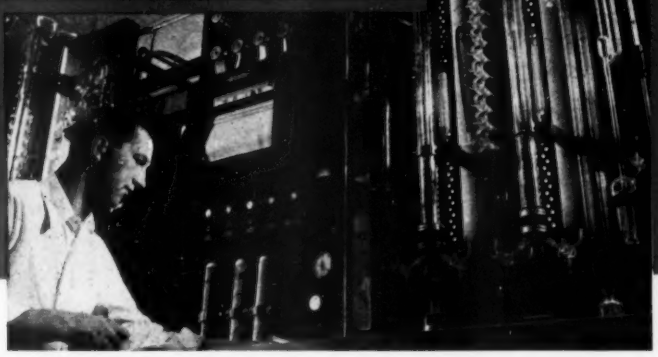
Capital Stock	$12,000,000.00	
Surplus Fund	12,000,000.00	
Undivided Profits	4,348,565.58	$ 28,348,565.58
Reserved for Contingencies		3,152,091.96
Reserved for Taxes, Etc.		3,297,718.31
Interest Collected not Earned		315,766.58
Letters of Credit and Acceptances		8,897,444.25
DEPOSITS		
Individual	$289,348,372.38	
Banks	207,854,550.16	
U. S. Government	11,102,034.71	508,304,957.25
		$552,316,543.93



On the threshold of process perfection...

BROWN *Instrumentation*

. . . is patterned to the exact requirements of individual plants and processes . . . is the result of engineering and application know-how, with one responsibility from sensing elements to control valves . . . is backed by a nation-wide field engineering and service organization.



PROVING processes in the pilot plant stage can save untold millions of dollars in "on-stream" operations. But bridging the gap between fluid ounces per hour in the laboratory and hundreds or thousands of barrels per hour in the plant takes considerable doing.

Thorough instrumentation in the pilot plant provides . . . (1) *a saving in scientific man-hours*, through the centralization of critical data which eliminates the hand logging of hundreds or even thousands of points . . . (2) *easy and rapid interpretation of data*, through automatic coordination and recording in chart form . . . and (3) *process simplification*, through a complete understanding of control problems well in advance of full-scale operations.

Add to these advantages the fact that, with instruments, pilot studies are accomplished in much less time . . . for instruments *accelerate* research. Investigate the wide application possibilities of Brown Instrumentation. Our local engineering representative is qualified to discuss your requirements . . . and he is as near as your phone.

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First in Controls

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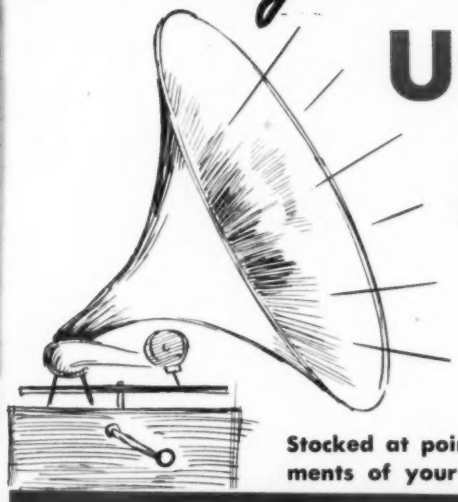
● *Important Reference Data*

WRITE FOR A COPY OF 84-PAGE BULLETIN NO. 15-14, "INSTRUMENTS ACCELERATE RESEARCH"... AND NEW BROCHURE, "TOMORROW IS TODAY."

Shot Hole Casing —

Average Pull-out Strength 15000#



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Subsidiary of Jones & Laughlin Steel Corporation

Stress relieving prefabricated piping with highly developed equipment and special techniques is one reason why exacting specifications are met with

GRINNELL PREFABRICATED PIPING

Grinnell received an order recently for stress relieving prefabricated piping to these specifications:—

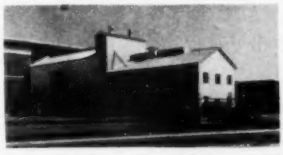
> "All fabricated pieces shall be normalized and drawn by heating to a uniform temperature of 1700°F (plus or minus 25°F). This temperature shall be maintained on a basis of one-half hour for each quarter inch of wall thickness of the heaviest pipe in the furnace charge followed by air cooling not less than 600°F. All pieces shall then be reheated to 1425°F and held at temperatures as above. In no case shall the time be less than 2 hours . . . Cool at a controlled rate not to exceed 200°F per hour until 600°F is reached . . ."

Grinnell, of course, met these specifications precisely. In fact, fabricating industrial piping today demands the *maximum* in versatility and precision.

Modern power plants, for example, need piping of heavy cross-sectional area and definite alloy composition to provide high temperature stability, resistance to creep and graphitization. Chemical and oil refining processes, on the other hand, must have piping of high chrome alloy to impart strength at high temperatures, resist corrosion, withstand impacts at low temperatures. Heat-treating often is the only answer — either to restore properties affected during fabrication, or improve original properties.

GRINNELL'S AUTOMATIC HEAT-TREATING FURNACE

performs with positive efficiency. This versatile stress-relieving unit, measuring 12 by 12 by 40 feet and using gas or oil or both as fuel, was designed to give full program control for the entire range of working temperatures. It provides instrument control of rate of rise in temperature of the charge, length of time for holding at the predetermined temperature level, and cooling rate. Two recording controllers are provided for the furnace and a separate 6-point recorder registers the temperatures of the charge simultaneously during the treating cycle.



Exterior View of Building

In heat-treating, as in everything else for piping, Grinnell has the experience and the costly equipment to fully protect large piping expenditures. That is why it will always pay you to call on Grinnell for *all* of your piping needs.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company Inc., Providence, Rhode Island • Sales Offices and Warehouses in Principal Cities

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

Saving weight and space was vital in the building of this vacuum tank truck—used to pump and haul away mud, water and waste oil from sump holes at drilling wells and refineries. Speedaire helped solve that problem. Photo courtesy of Associated Oil Co. of California.

SPEEDAIRE on sump truck saves $315

POWER is transmitted from the engine to the vacuum pump of this oilfield sump truck by a Speedaire unit. For this special job, a fan-cooled speed reducer is ideal. It affords a 3-way saving: it saves 650 pounds, or 54% of the weight; saves 6.1 cubic feet, or 61% of the space occupied; saves $315, or 34% of the initial cost of a conventional worm-gear drive.

Speedaire is Cleveland's fan-cooled worm-gear speed reducer. Because it is fan-cooled, Speedaire does more work—delivers up to *double the horsepower* of standard worm units of equal frame size, at usual motor speeds. It can be installed economically on many applications where other types have been used heretofore—giving you the advantage of a compact right-angle drive. Speedaire gives the same long, trouble-free service characteristic of all Clevelands.

For full description, send for Catalog 300. The Cleveland Worm & Gear Co., 3286 E. 80th St., Cleveland 4, O.

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● GOOD SERVICE...

at the sign of the Green Triangle

There's more to a pumping engine than meets the eye. But your eyes alone will give you four reasons why you should buy **CSCO** pumping engines.

4 reasons why that meet the eye

You can see for yourself that... **1. CSCO engines permit checking or adding oil or water..without a shutdown.**

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Behind what you can see there's a story, too. One of satisfied users and years of field experience. Write for bulletin or visit a Continental store.

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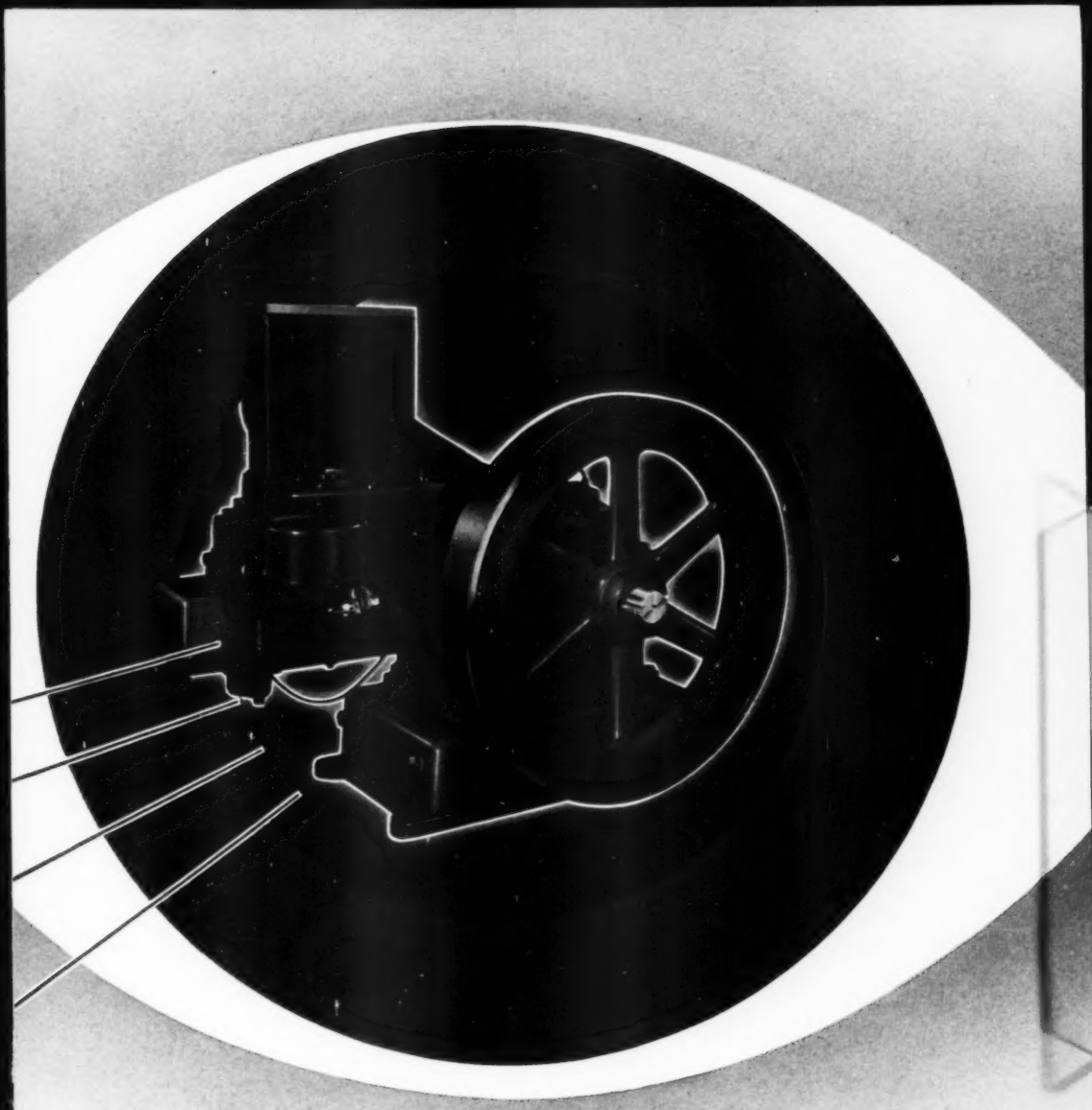

Sound engineering, rugged construction, long-life parts . . . that's why CSCO Engines mean more economical operation to you! In addition to being the outstanding oil pumping engine, the CSCO gives the same top-notch performance in such uses as power generation, lighting, water pumping and other functions calling for a prime mover.

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Call Continental with confidence! Supplies and Equipment for every important operation in the oil and gas industries . . . for rig or refinery, for pipe-line or gas plant. Proven Continental "Green Triangle" Service, provided by 72 Continental stores and offices, is your guarantee of helpful assistance in solving your own equipment or supply problems.

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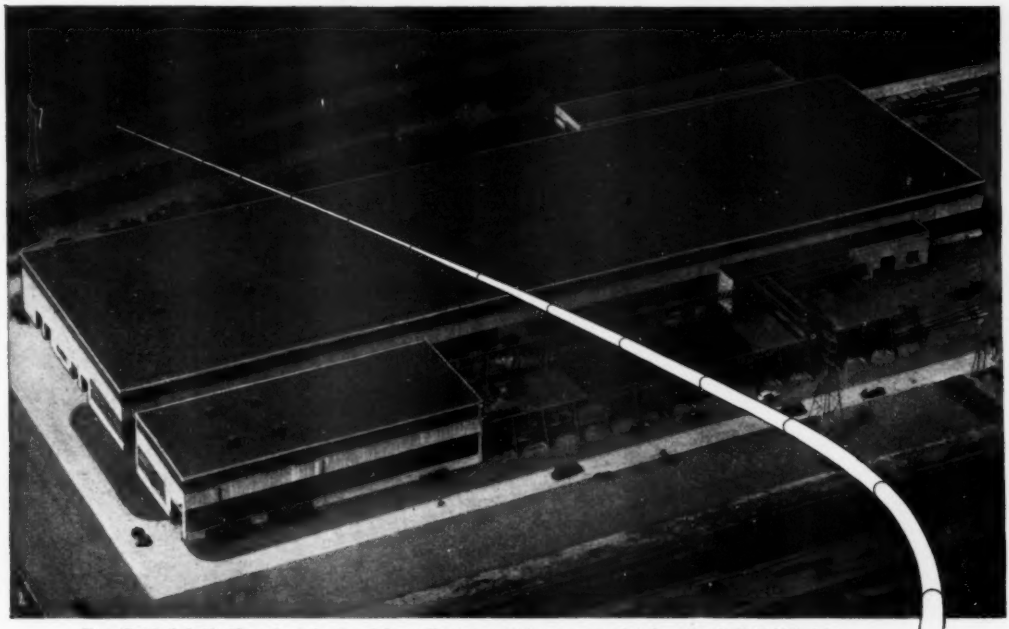
FIRSTnames in pipelines depend on the FIRST* name in line pipe



Pipe mill of A. O. Smith of Texas, located on Green's Bayou, Houston, next to its co-owner and steel supplier, the Sheffield Steel Corp.

A. O. Smith Welded Line Pipe Now Flowing from New Houston Facility

- **Increasing A. O. Smith's productive capacity of large diameter welded steel pipe . . .**
- **Reducing freight costs in shipping A. O. Smith line pipe . . .**
- **Assuring a complete range of line pipe sizes, from 8⅝ inches to 36 inches in diameter . . .**

These are the functions of the new plant of A. O. Smith of Texas, with a productive capacity of 200 miles of line pipe per month.

Strategically located, this mill supplements production of the Milwaukee works, placing line pipe convenient to transportation for the great southwest and central states.

Rely on A. O. Smith, known throughout the petroleum industry for its engineering, technical skill and productive capacity.

* FIRSTS by A. O. Smith • Welded line pipe • Internal expanded pipe • Light wall large diameter pipe • World's largest producer of large diameter welded steel pipe.

DEPENDABILITY *through* **RESEARCH** *and* **ENGINEERING**

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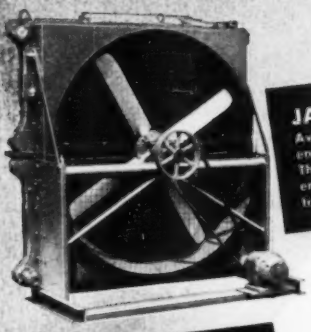
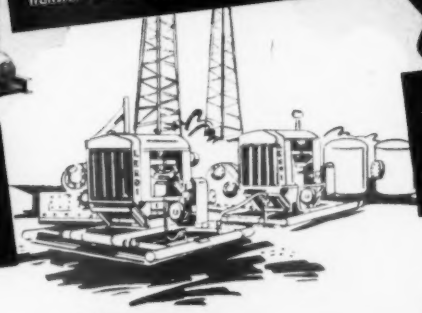
4 WAYS TO BEAT THE HEAT!

IN OIL FIELD COOLING AND CONDENSING
WITH MANUFACTURER'S RESPONSIBILITY AS YOUR GUARANTEE

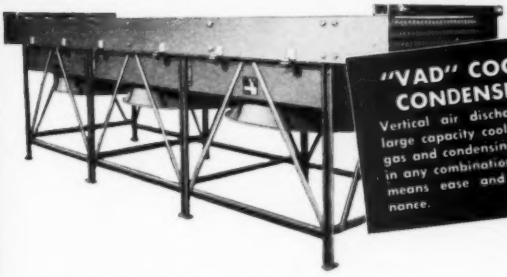


JACKET WATER COOLERS
Available in a wide range of sizes for engine jacket water or lube oil cooling. These units are sturdy, compact, and engineered to provide maximum heat transfer with low hp requirement.

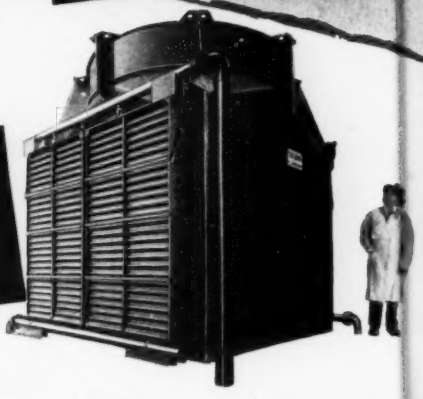
"HC" COOLERS
Multiple unit installations provide economical handling of water, oil or gas cooling and steam and vapor condensing in any combination. Easily installed in the field.



HEAT EXCHANGERS
Space-saving units available from stock in fixed or removable tube bundle types. For jacket water or lube oil cooling in stationary or marine (fresh and salt water) applications.



"VAD" COOLING AND CONDENSING UNITS
Vertical air discharge units for extra large capacity cooling of water, oil and gas and condensing of steam and vapor in any combination. Low-level mounting means ease and economy in maintenance.



In addition to the field-tested products shown above, Young offers: gas, gasoline and Diesel engine cooling radiators; atmospheric and evaporative coolers and condensers; supercharger intercoolers, and similar products for the Petroleum Industry. Young supplements the design engineering of its equipment with application ingenuity thereby increasing the practicability of all Young products. For example, the popular "Vertiflow" Unit Heater, has been used successfully as an economical condenser. It can also cut heating costs by using the waste heat from engine jacket water for space heating. Young *engineered* applications cost no more. Contact your nearest Young Representative for further details.

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Heat Transfer Products for Automotive and Industrial Applications.

Young Quality — T. M. Reg. U.S. Pat. Off.

Heating, Cooling, Air Conditioning Products for Home and Industry.

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Racine, Wisconsin

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- ☐ Heat Exchangers
- ☐ Jacket Water Cooling Radiators
- ☐ "HC" Cooling and Condensing Units
- ☐ "VAD" Cooling and Condensing Units

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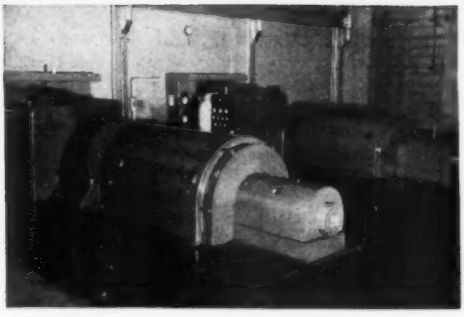
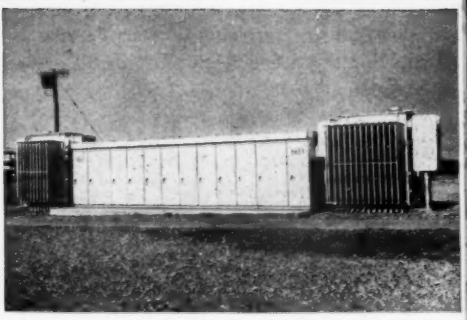
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

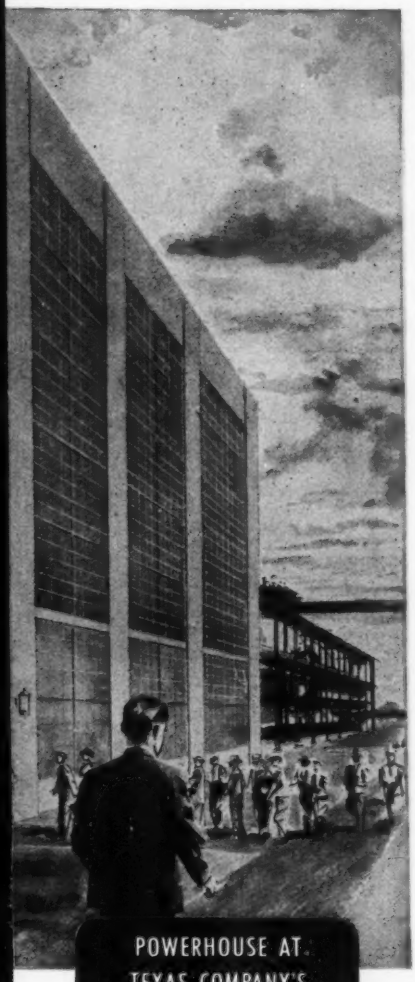


Power is supplied by two Westinghouse Turbine-Generators—plus a stand-by tie-in with utility power. From here, power is sent through *dual feeders* at *high voltage* to substations and load centers throughout the plant.



Each substation is complete with switchgear, transformers and circuit breakers—for redistribution of low-voltage power. This method makes the system highly flexible and dependable and improves voltage regulation.

Here's how *Power System Planning* pays off at Eagle Point Refinery



POWERHOUSE AT TEXAS COMPANY'S NEW EAGLE POINT, N. J., REFINERY

When The Texas Company built their new refinery at Eagle Point, New Jersey, they planned their power system carefully—and had Westinghouse help. They developed a system that's outstanding in dependability . . . in efficiency . . . and in flexibility for future expansion. Here's how they did it.

Refinery has two sources of power

Power is generated by two dependable Westinghouse Turbine-Generators (7,500 kw each). There's also a standby tie-in with the local utility—so that in an emergency they can immediately switch to utility power.

Twin power routes through the plant

From the turbines, power is sent to substations and load centers located throughout the plant. Each of these units has a dual feed. If there's trouble on one line, they switch to the other feeder.

Flexible system for easy expansion

This power distribution system is highly flexible. Suppose they want to expand the plant or add new machinery. All they do is add another substation. The rest of the system need not be disturbed.

High-voltage distribution saves money

In this modern system, each substation receives power at high voltage (13,800 volts). This cuts down on transmission losses. It improves voltage regulation throughout the plant.

Call in Westinghouse for your refinery needs

Westinghouse has had a great deal of experience in refinery power systems. We'd like to work with you and your engineers on your next project. When you're thinking about building or expanding, call in Westinghouse early. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania. J-94884

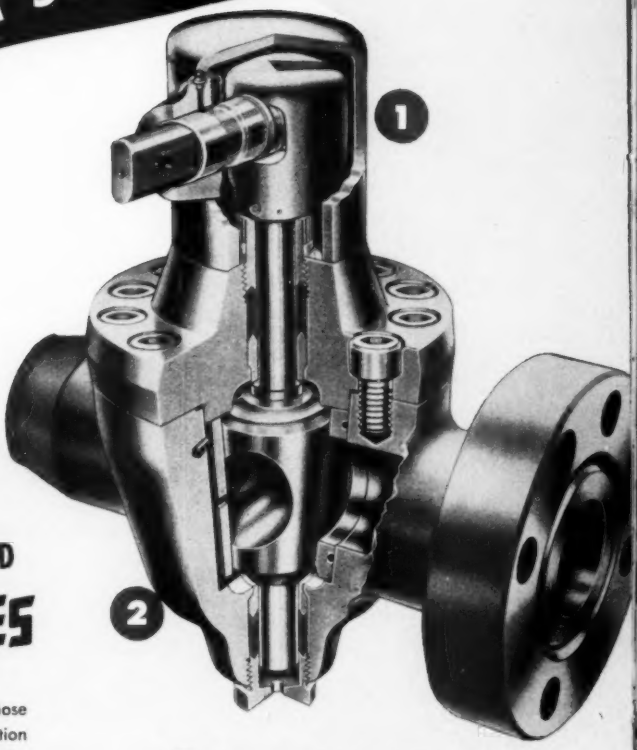
YOU CAN BE SURE...IF IT'S Westinghouse

EQUIPMENT FOR THE PETROLEUM INDUSTRY

HOT STUFF FOR HOT TAPS

BODY DISTORTION RESULTING FROM WELDING HEAT CANNOT IMPAIR THE SEAL IN

Cameron NON-LUBRICATED LIFT-PLUG VALVES



Unlike ordinary gate and plug valves whose seat is integral with the valve body, distortion resulting from heat or line strains cannot affect the sealing qualities of a Cameron Non-Lubricated Lift Plug Valve.

Note in the cutaway view that the seat is separate and not attached to the valve body. When distortions occur, the geometry of the fit between the plug and seat is not disturbed. A resilient seal is provided between the seat and valve body.

Also, the separate seat feature of the Cameron Valve permits any desired trim for special services. Any part of the valve may be quickly and easily replaced without removing the valve from the line. No special tools or skill are required.

1 Lift-Plug actuator lifts, turns and reseats plug in only three-quarters of a turn of the operating wrench.

2 Separate, renewable seat: Pressure and line strain created body deflections cannot destroy the geometry of the fit between sealing surfaces because they cannot be transmitted to the separate seat.

Cameron IRON WORKS, INC.

P. O. BOX 1212, HOUSTON, TEXAS

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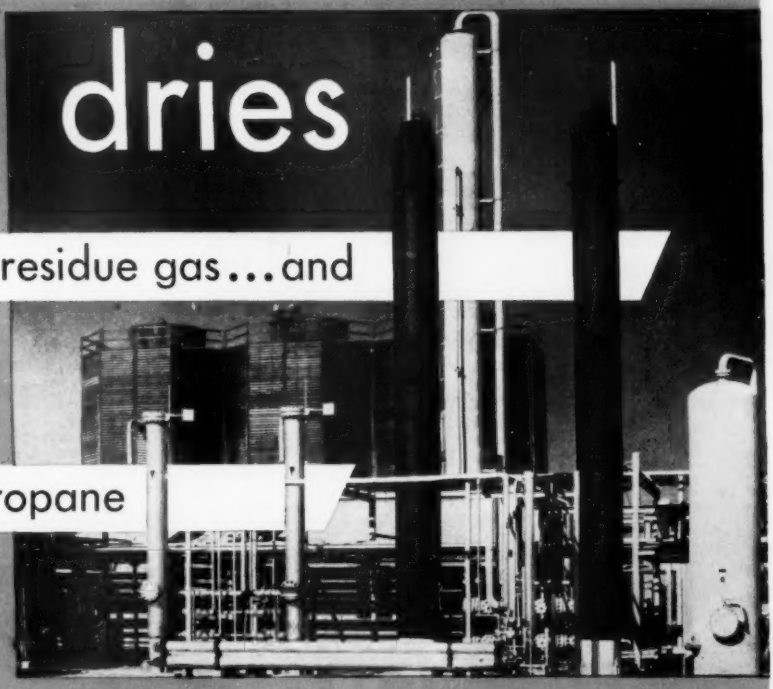
ALCOA Activated Alumina



at Cities Service Oil Company

At the Pampa, Texas, plant of Cities Service Oil Company, you'll find ALCOA *Activated* Alumina has been efficiently drying both liquid propane and residue gas since mid-1948. Approximately 22,000 gallons of propane pass through the liquid dehydration unit daily, while the other unit dries 8000 MCF of residue gas daily to as low as *minus* 20° F. dew point.

It is this type of steady, reliable dehydrating performance that has earned for ALCOA *Activated* Alumina a reputation as a dependable, economical desiccant. Commercially pure, it has outstanding stability of physical form and adsorptive properties. It will not swell, soften or disintegrate even when immersed in water. ALCOA *Activated* Alumina is non-corrosive and practically iron-free.

If you dry gas, vapors or organic liquids, you'll want to take advantage of the economies offered by ALCOA *Activated* Alumina. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 618A Gulf Building, Pittsburgh 19, Pa.

Alcoa Chemicals

ALCOA ALUMINAS and FLUORIDES

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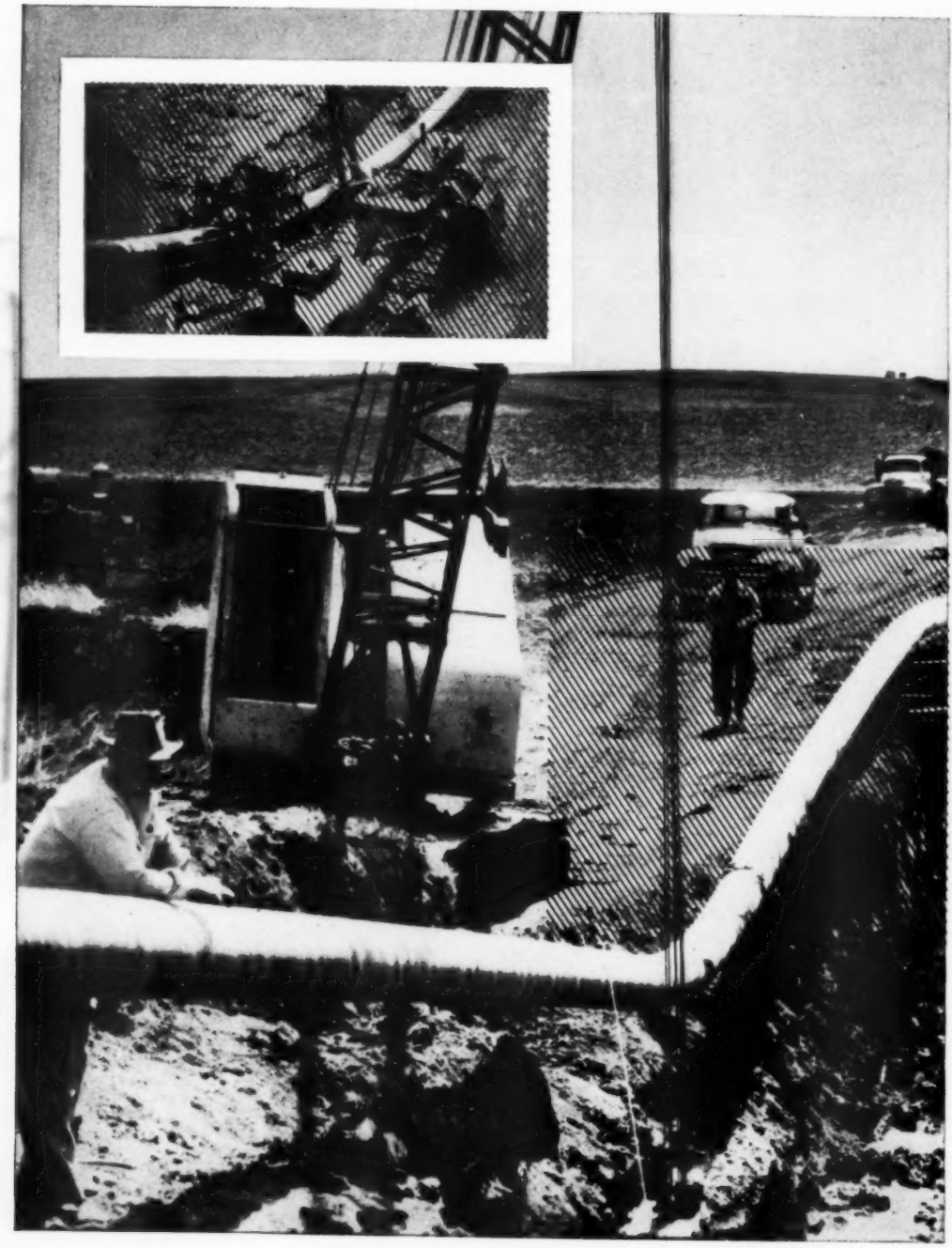
In the Nation's great new



underground transportation system

thousands of miles of NATIONAL Seamless Pipe are paying rich dividends in safe, dependable service

● The vast network of pipelines that carries gas, crude oil and refinery products to homes, plants, and factories of America now exceeds 533,000 miles in length . . . 136,000 miles longer than our total railway mileage.

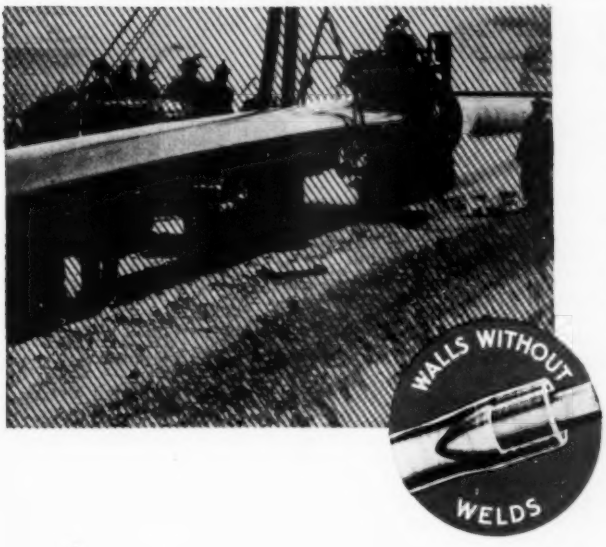
8 out of every 10 barrels of crude oil today move to U. S. refineries by pipeline. Natural gas sales are up 50% since 1945 and all the gas moves through pipelines.

Pipelining is big business. This year alone, 20,000 miles of new pipelines will be laid. In the year just past, the pipeline bill totalled a record-breaking $1 billion plus.

Since the very beginning of this vitally-important transportation system, NATIONAL Seamless Steel pipe has been used in ever-increasing quantities. Thousands upon thousands of miles are now in service. The famous "Big Inch" line was built almost entirely with NATIONAL Seamless . . . the first, and still the finest seamless pipe produced in the United States.

For NATIONAL Seamless is pierced from a solid billet of high-quality steel . . . the one method that removes all doubt concerning uniform wall strength. In these famous "Walls without Welds" there are no lines of potential weakness—no longitudinal welds to weaken or injure the pipe. As a result, pipeline companies have *confidence* in NATIONAL Seamless. They know from experience that money just can't buy anything better.

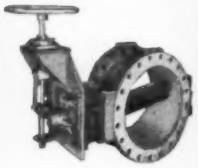
In the future, as in the past, NATIONAL Seamless quality will be jealously maintained to the same high standards that has made it preferred not alone for pipelines but for drill pipe, casing and tubing as well.



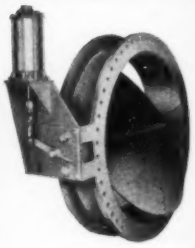
NATIONAL TUBE DIVISION
UNITED STATES STEEL COMPANY, PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS · UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

No. 797—24-inch heavy duty electric motor operated valve. Handwheel for manual use in case of current failure.



No. 700—20-inch class "B" cast iron valve equipped with heavy duty handwheel control and threaded reach rod.

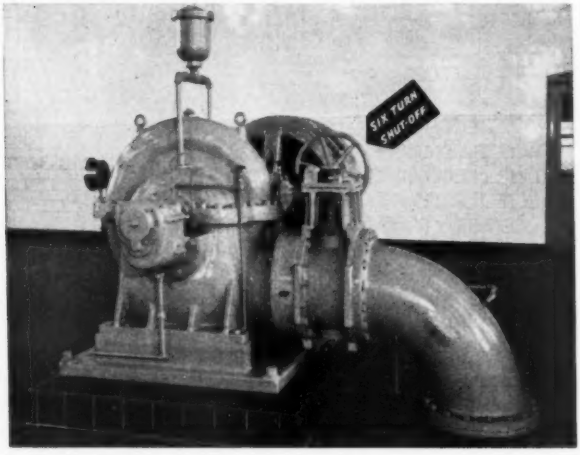


No. 627—Cylinder operated 60-inch heavy duty valve (either pneumatic or hydraulic control).

R-S Valves are synonymous with the simplified control and shut-off of any material that flows or is forced through a pipe, under a wide range of pressure and temperature.

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •



ATLANTIC CITY Simplifies PUMP SHUT-OFF

New pumping units of the modern Atlantic City Pumping Station supplying water for this seashore resort are equipped with 125-pound handwheel operated R-S valves.

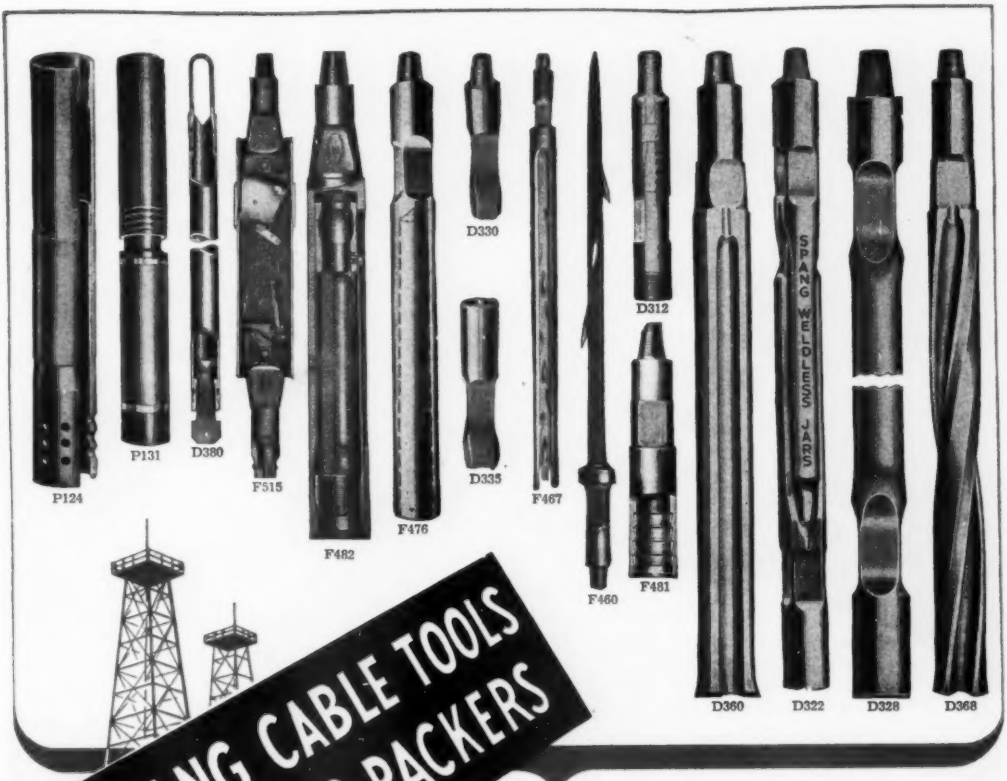
The valve illustrated above is closed in a matter of seconds (only six handwheel revolutions required) before the pump is started in order to prevent an overload on the pump and motor. The valve is then opened gradually and easily regulated according to demand.

Such valves can be equipped with hydraulic cylinders (tapped into the pipe line before and after the pump). As long as the differential pressure remains above a predetermined value, the cylinder will hold the valve open. Power or mechanical failure will cause a drop in the differential pressure, and the cylinder will close the valve automatically. Water hammer is impossible since the valve closes only as fast as the adjustable cylinder bleeds.

Specify R-S Valves for simplified construction and operation.

R-S PRODUCTS CORPORATION
4600 Germantown Avenue, Philadelphia 44, Pa.
An S. Morgan Smith Company Subsidiary

DISTRICT OFFICES IN PRINCIPAL CITIES



SPANG CABLE TOOLS and SPANG PACKERS aid modern drilling in All Fields

Spang Cable Tools and Spang Packers have been developed in the belief that the best equipment and the best maintenance result in the most economical drilling. Spang Tools, built for rugged service, are known and preferred the world over. They are available through leading supply companies and field shops everywhere.

Your Favorite Supply Dealer
recommends and sells
SPANG CABLE TOOLS

D312—Swivel Rope Socket
D322—Weldless Jar
D328—Drilling Stem
D330—Stem Pin
D335—Stem Box
D360—Straight Drilling Bit
D368—Twisted Drilling Bit
D380—Regular Bailer
F460—Center Rope Spear
F467—Three Prong Grab
F476—Solid Bored Friction Socket
F481—Multi-Slip Collar Socket
F482—Full-Circle 3-Slip Slip Socket
F515—Reversible Casing Ripper
P124—Deep-Hole Special Bottom-Hole Packer
P131—Screw-Release Casing-Anchor Packer

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SPANG & CO.
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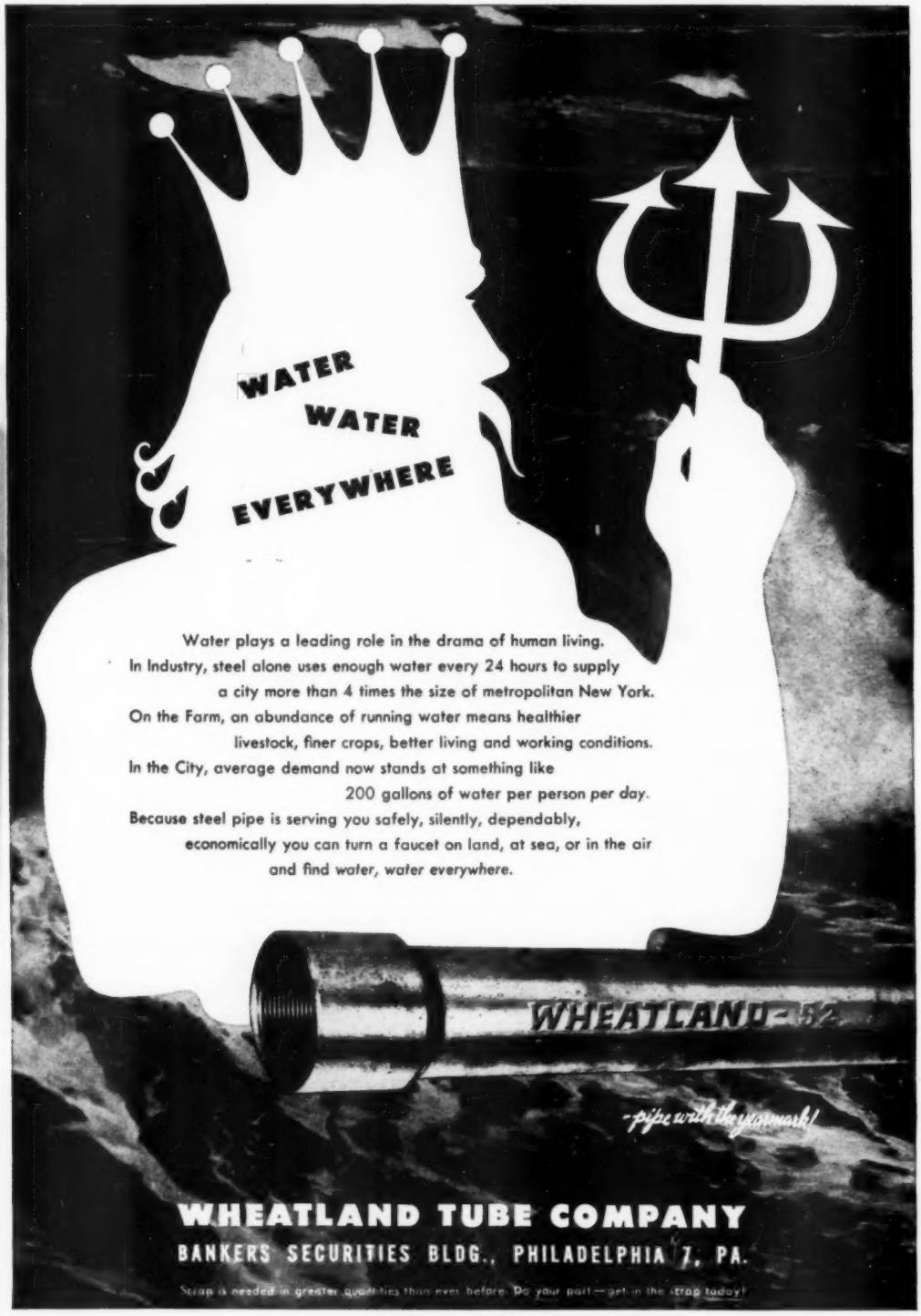
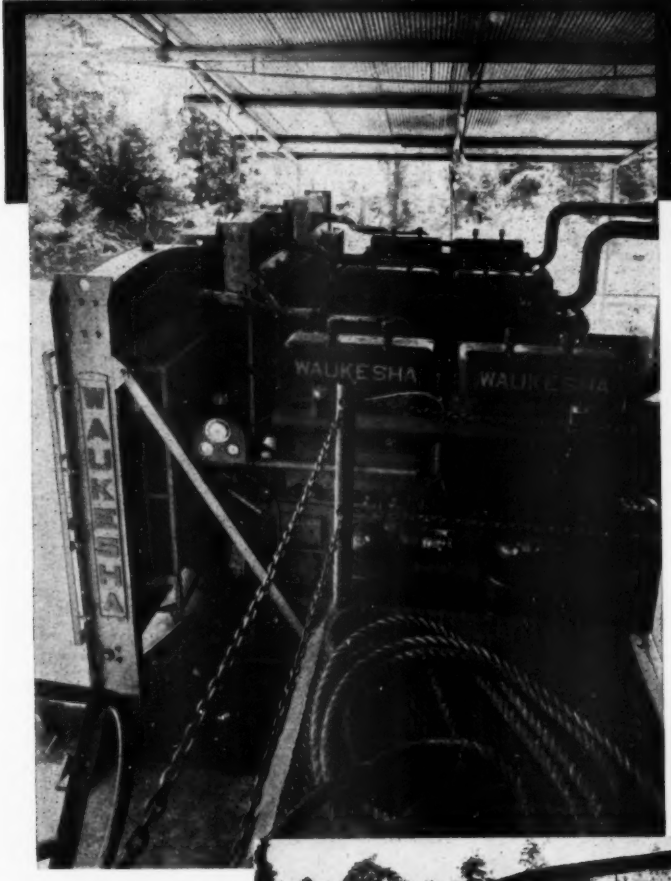
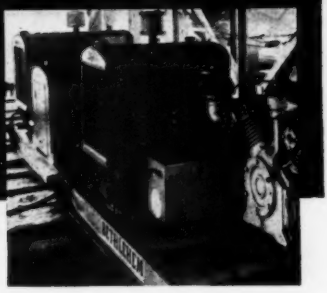
The Higher Standard

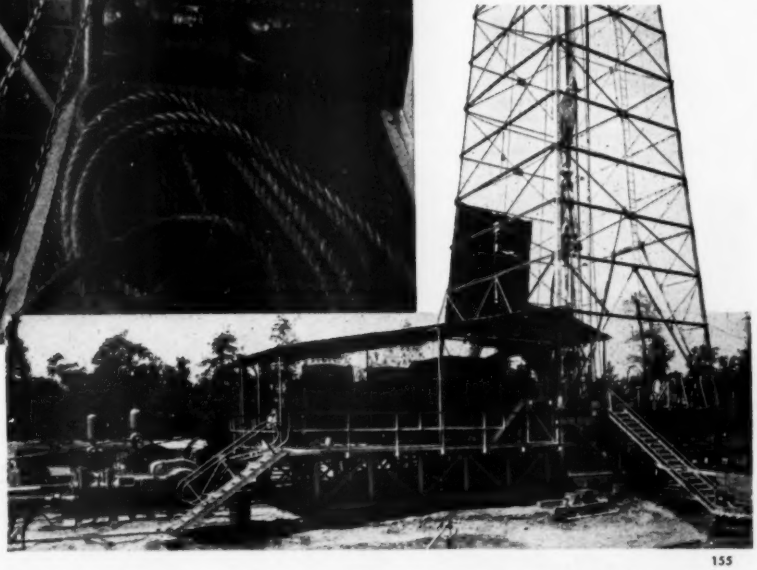

WATER
WATER
EVERYWHERE
Water plays a leading role in the drama of human living.
In Industry, steel alone uses enough water every 24 hours to supply a city more than 4 times the size of metropolitan New York.
On the Farm, an abundance of running water means healthier livestock, finer crops, better living and working conditions.
In the City, average demand now stands at something like 200 gallons of water per person per day.
Because steel pipe is serving you safely, silently, dependably, economically you can turn a faucet on land, at sea, or in the air and find water, water everywhere.
WHEATLAND
-pipe with the yardmark!
WHEATLAND TUBE COMPANY
BANKERS SECURITIES BLDG., PHILADELPHIA 7, PA.
Scrap is needed in greater quantities than ever before. Do your part—get in the scrap today!

5 WAUKESHAS power this new Bethlehem DRILLING rig





Woolf and Magee Drilling Co. are the owners of this new *Bethlehem* rig. Two Waukesha FCU units power the auxiliaries. The three prime movers are Waukesha 6-LRZU Gas Power Units which have not only repeatedly proved their capacity, speed and flexibility for high production drilling, but also their reliability in continuous service.



WAUKESHA 6-LRZU Gas Power Units—six cylinders, 9 3/8-in. bore x 8 1/2-in. stroke, 3520 cu. in. displ., 350 hp continuously at 900 rpm; 475 hp peak for momentary overloads. **Send for Bulletin 1481.**

155

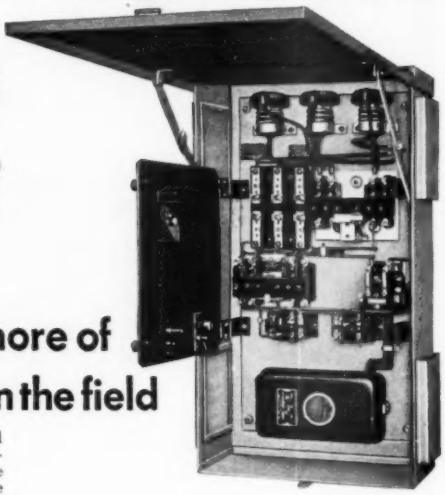
WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN • NEW YORK • TULSA • LOS ANGELES

PROVED IN THE PANHANDLE

PROVED ON THE GULF

PROVED IN THE EAST

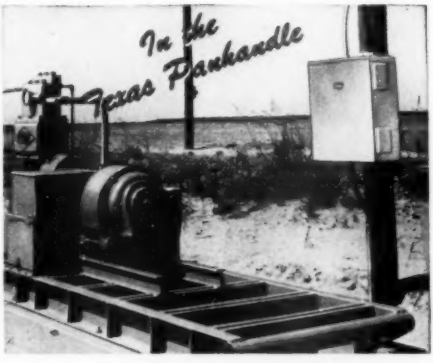
Cutler-Hammer Oil Well Pumping Control has more of what you want than anything in the field



The Cutler-Hammer Oil Well Pumping Control is shaped by the special requirements of the oil country into the oilfield's outstanding well pumping control. It beats the heat. It beats the dust. It stands up in the toughest tests.

Aluminum painted enclosures beat back the sun's heat. Proper ventilation drains off the heat from inside. You don't have to prop the door open to dirt, insects and birds to keep this controller cool and working. Fine mesh screened, louvered and guarded ventilation, vertical dust-safe, dust-shedding contacts, neoprene gasketed dustproof timer enclosure, timer clock motor with excess torque—all these features keep the controller working in dustiest climates.

Unit type lightning arresters reveal condition at a glance. You don't have to rebuild controller if one blows. The Cutler-Hammer Controller with automatic timed restarting feature means the attendant doesn't have to reset the control after a power failure. He knows the C-H Controller will restart the motors on a safe staggered time sequence. When on-off pumping schedule is changed, the change is made simply by pulling accessible tabs, one pull for each 15-minute change—and no guessing. To reset a clock to correct time of day, attendant simply turns a handy palm size dial forward or backward. The wiring diagram with spare parts list and overload heater coil ratings is sealed in a dirt, grease, water and heat resisting plastic coat. You and your men will like these oil country starters better than any you've ever seen. CUTLER-HAMMER, Inc., 1453 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.



IT'S PACKED WITH SATISFACTION WHEN IT'S PACKED WITH **R/M**

You will find Raybestos-Manhattan packings and gaskets in machines like this reciprocating boiler-feed pump, and in practically every other type of fluid-handling equipment in industry. The long line of R/M packings and gaskets is relied on by experienced engineers, not only for pumps, but for valves, compressors, expansion joints, hydraulic rams, and wherever trouble-free service is essential. The R/M distributor near you will gladly help you select the right packing or gasket for your needs. Or write for the R/M Packing Catalog.

R M

PACKINGS

RAYBESTOS-MANHATTAN, INC.

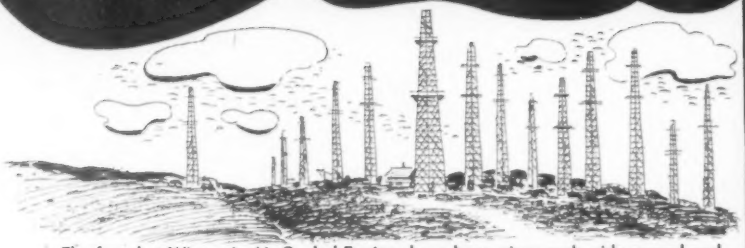
PACKING DIVISION, MANHEIM, PA.

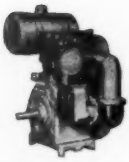
FACTORIES: Bridgeport, Conn.; Manheim, Pa.; No. Charleston, S.C.; Crawfordsville, Ind.; Passaic, N.J.; Peterborough, Ontario, Canada

RAYBESTOS-MANHATTAN, INC., Manufacturers of Packings • Asbestos Textiles • Mechanical Rubber Products • Abrasive and Diamond Wheels • Rubber Covered Equipment • Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Radiator Hose • Sintered Metal Products • Bowling Balls

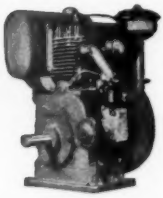
Performance-Proved Field-Tested POWER...

WISCONSIN HEAVY-DUTY Air-Cooled ENGINES

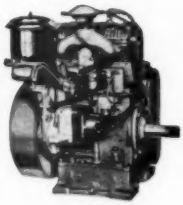




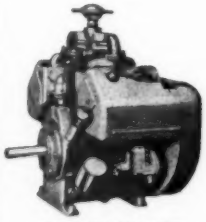
Models ABN, AKN, AEN
4-cycle
Single Cylinder
3 to 7½ hp.



Models AFH, AGH, AHH
4-cycle
Single Cylinder
6 to 9 hp.



Models TE, TF
2-cylinder
7 to 13 hp.



Models VE4, VF4, VP4D
V-type, 4-cylinder
15 to 31 hp.

The fact that Wisconsin Air-Cooled Engines have been given such wide-spread and enthusiastic acceptance in the Oil Field is due to several good, solid factors:

1 Field-Tested. Wisconsin-powered equipment is being tested constantly under actual operating conditions by the field staff of Harley Sales Company. Accurate service records determine the advantages and limitations of the units on test, thereby providing the customer with ultraconservative performance claims. The customer knows, in advance of purchase, what to expect . . . and usually his best expectations are more than fulfilled.

2 Performance-Proved. Thousands of Wisconsin Heavy-Duty Air-Cooled Engines, ranging from the power-packed little ABN and AKN models (3 to 6 hp.) to the husky VP4D V-type, 4-cylinder job, turning up 31 hp. at 2200 R.P.M., are delivering hard-hitting, dependable power every day, under all conceivable operating conditions. "Most H.P. Hours" of performance-proved service provides tangible evidence of Wisconsin Engine stamina and economy.

3 Sellers' Service. As primary oil field distributors, the Harley Sales Company has full recognition of the need for prompt delivery of equipment and parts and maintains exceptionally large warehouse stocks. Orders for parts are handled the same day they are received.

4 Manufacturer's Responsibility. As the world's largest builders of heavy-duty air-cooled engines, the Wisconsin Motor Corporation has a responsibility both to the *seller* and user that is fully met and sustained to the limit of our ability.

All this adds up to the kind of a deal that pays off for the power user in terms that are most satisfactory to him.

WISCONSIN MOTOR
Corporation
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

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OIL FIELD DISTRIBUTORS FOR WISCONSIN ENGINES AND ALL TYPES OF UTILITY UNITS.

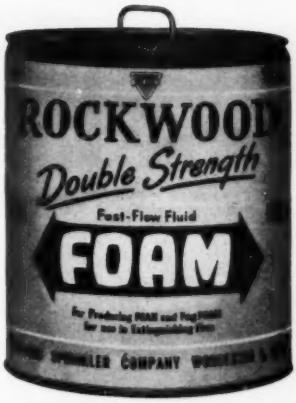
NEW ROCKWOOD FOAM LIQUID
NEW ROCKWOOD FOAM DEVICES
NEW ROCKWOOD METHODS
for
APPLYING FOAM TO Gasoline Fires

New Rockwood *Double Strength* FOAM Liquid and FogFOAM devices enable fire fighters to cover burning surfaces faster with a blanket of FOAM that completely seals off combustible vapors. The FOAM blanket will quickly reseal if broken by trucks, hose, foot tracks, etc. The new Rockwood method of applying FOAM to fires involving oil, gasoline and other flammable liquids and materials will extinguish fires with far greater speed and with less work than with old style methods. Rockwood FOAM is designed to give you the most efficient results in fire fighting and to protect apparatus from damage. For complete operating and installation data and prices, write today.

The most efficient way to apply Rockwood FOAM Liquid and wetting agent to most fires is thru Rockwood fire fighting devices.

ROCKWOOD

ROCKWOOD SPRINKLER CO.
104 Harlow St., Worcester 5, Mass.
Portable Fire Protection Division

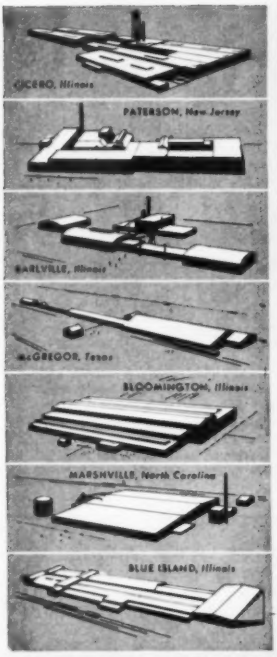


1. Rockwood's new FOAM Liquid produces FOAM and FogFOAM for use in extinguishing flammable liquid fires. It can be automatically mixed with water supplied to the new FFF FogFOAM Nozzle or to the new "FF" Extension by means of the hose line FOAM Eductor — or Rockwood FOAM proportioning systems built into fire trucks. Rockwood regular FOAM is still available for use with Rockwood devices.

2. New *Lightweight* type FFF Rockwood FogFOAM Nozzle with FogFOAM screen. Available in three sizes for service on 1½" and 2½" or 3½" hose. Discharges (1) FogFOAM (with FogFOAM screen) (2) Solid FOAM stream (with FOAM shaper) (3) High velocity WaterFOG pattern.

3. Rockwood FOAM Eductor introduces FOAM Liquid into fire hose lines for use with Rockwood Type FFF FogFOAM Nozzles or "FF" Extension units with SG-60 Nozzles. Eductor can be attached between discharge of fire truck and fire hose line, connected between hydrant and hose line or between two lengths of hose. Separate models are available for FOAM and water wetter.

4. Rockwood *Lightweight* "FF" Extension unit with SG-60 WaterFOG Nozzle attached. The "FF" Extension can be easily attached to a ¾", 1" and 1½" SG-60 WaterFOG Nozzle by simply removing high velocity WaterFOG tip and inserting "FF" Extension. This unit discharges high velocity FogFOAM thru FOAM screen or long range solid FOAM stream thru FOAM shaper — also high velocity WaterFOG, solid water stream or low velocity WaterFOG.



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EVER BETTER INSULATION SO THAT INDUSTRIES CAN

Save Btu's on pipes of peace or war

Whatever your insulation problem, whether it is to retain heat or cold; whether it is a conventional pipe application or a unique or complicated condition involving close quarters and the need for the most rugged construction, Unarco has a type of insulation to help you meet the problem most efficiently and economically. Unarco engineers utilize the best material for the job with many exclusive Unarco construction features that have made these insulations a standard in industry.

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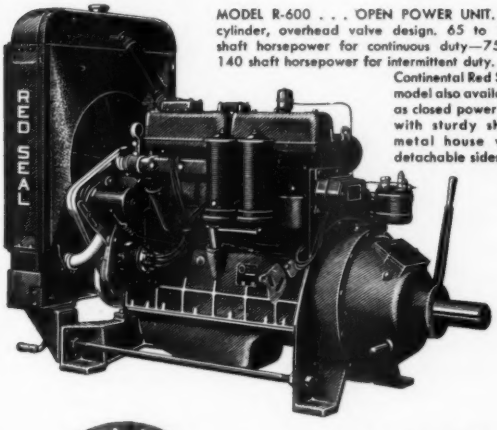
RED SEALS . . .

Squeeze

ALL THE POWER FROM ANY FUEL

Dependability is only one of the reasons for the oil fields' ever-wider use of Continental Red Seal power. Economy is a big factor, too. Today's fine Red Seal line embodies refinements in carburetion, manifolding and valving which extract the final ounce of power from any fuel. There are mighty few jobs in the oil field which a Continental Red Seal won't perform more dependably, at lower fuel and maintenance cost, than any other power plant you can buy.



MODEL R-600 . . . OPEN POWER UNIT. Six cylinder, overhead valve design. 65 to 110 shaft horsepower for continuous duty—75 to 140 shaft horsepower for intermittent duty. This Continental Red Seal model also available as closed power unit with sturdy sheet metal house with detachable sides.

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Full-length water jacketing.

Controlled-direction coolant flow.

Chrome plated top piston rings.

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Continental Motors Corporation
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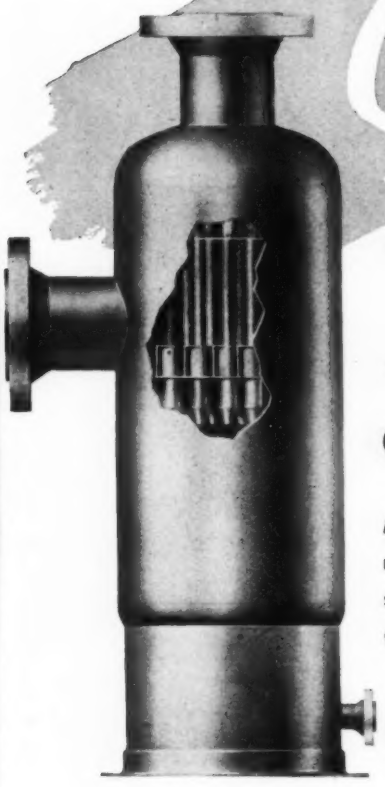
Clean

DRY GAS

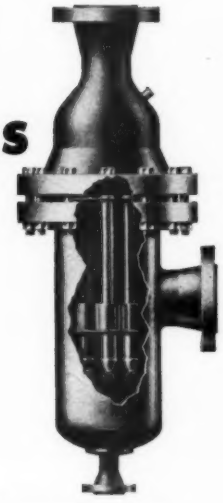
in secondary distribution systems

with AEROTEC

GAS SCRUBBERS



Multiple cyclone tubes of small diameter, assembled in the pressure shell, separate impurities from the gas with high efficiency.



LARGE VERTICAL TYPE

SMALL VERTICAL TYPE

Gas in your distribution lines stays clean and free-flowing with Aerotec Dry Gas Scrubbers on the job. These units apply the principle of centrifuging to remove entrained dusts, liquids, and distillates from the gas. It is a *dry* cleaning process. There is no oil or other filtering medium to carry over into the gas stream. Aerotec also eliminates other difficulties normally experienced with conventional types of scrubbers.

Simple in design and lightweight, Aerotec Dry Gas Scrubbers are available in sizes and capacities to meet all requirements of local distribution systems. Leading utilities such as Consolidated Edison Co., Manufacturers Light & Heat Co., Rochester Light & Heat Co., and many others use Aerotec units in scores of locations with outstanding results.

A Thermix Project Engineer is near you and will be glad to supply technical data and assistance in choosing Aerotec Dry Gas Scrubbers to fit your specific needs. Call or write.

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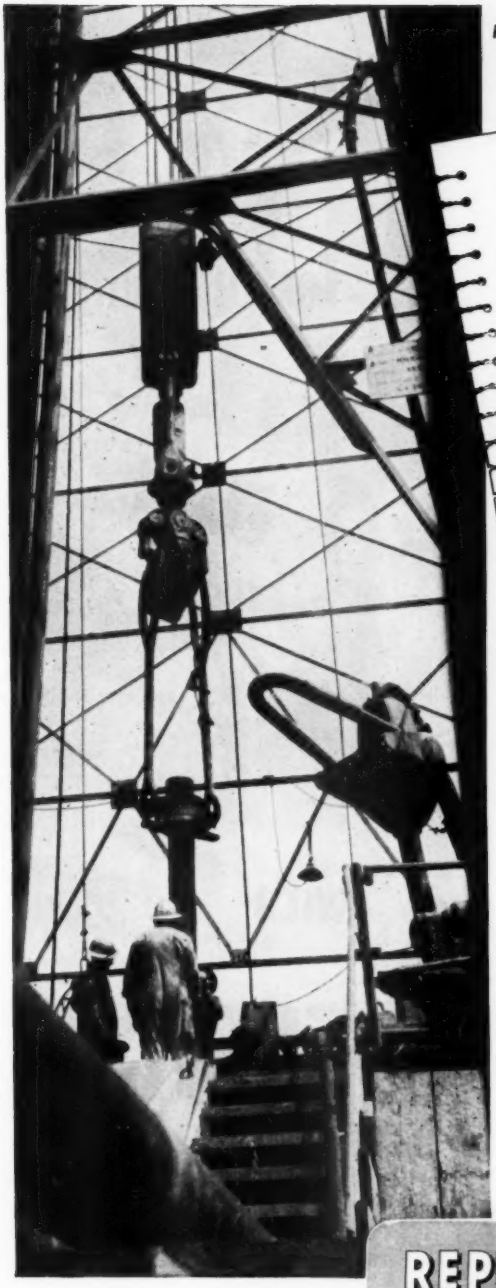

REMINDERS OF GOOD CASING PRACTICES:

How to save strings from shock loads

Casing strings should be picked up and lowered carefully, and care exercised in setting slips to avoid shock loads. Dropping a string even a short distance may loosen couplings at the bottom of the string. Care should be exercised in setting casing down on bottom, or otherwise placing it in compression because of the danger of buckling, particularly in that part of the well where hole enlargement has occurred.

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...and, remember that

REPUBLIC
Electric Weld Casing and Tubing

- *Make-up fast*
- *Resist collapse*
- *Resist pull-out*

. . . because they're uniformly round, uniformly strong, uniformly straight, and uniform in wall thickness. Each length is formed from high ductility steel, fully normalized for uniform structure. Casing is cold sized to further increase its high yield strength. Clean, full-formed threads stab, spin-in and tong-up fast . . . and tight. The uniform depth of tough steel under thread roots all around the pipe protects against pull-outs. You can specify "Republic Electric Weld" with confidence.

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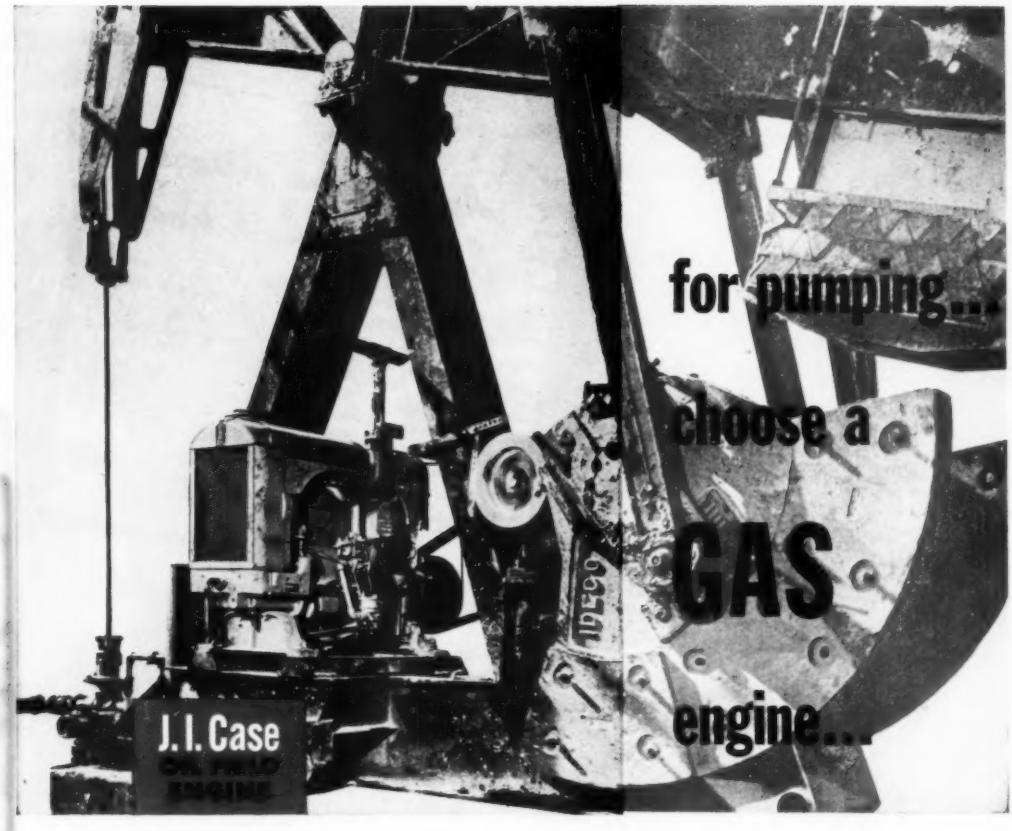
REPUBLIC *Electric Weld* NORMALIZED CASING AND TUBING

REPUBLIC STEEL

Other Republic Products include Line Pipe—Carbon, Alloy and Stainless Steels—Upson Studs, Bolts and Nuts—Electrunite Heat Exchanger Tubes



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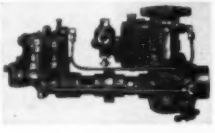
dependable, economical, powerful

This very popular J. I. Case oil field engine equipped with Ensign carburetion is typical of thousands in regular 'round the clock service.

Carburetion equipment on this engine consists of the famous Ensign Combination Model in which either natural gas, Butane-Propane or gasoline may be used. Powerful and economical gas engine performance depends in no small degree upon the carburetion equipment. We have specialized in the field of industrial carburetion for over 40 years and shall be pleased to share our experience with you.



ENSIGN CARBURETOR COMPANY

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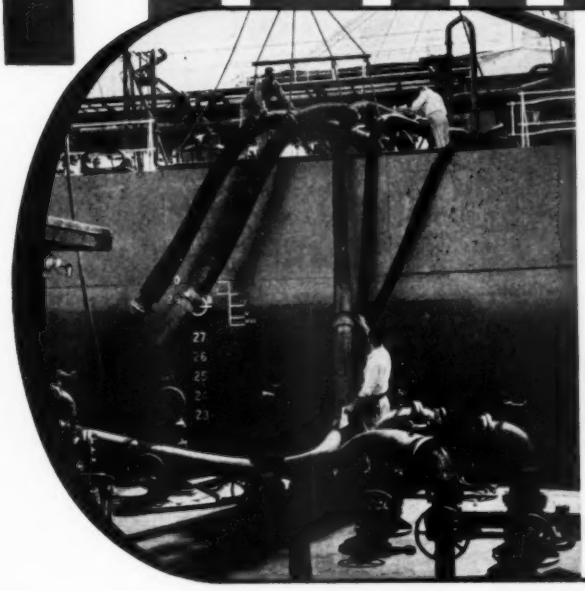
Industrial rubber products especially built for LONG SERVICE

PIONEER



Cooperation produced this exceptional oil hose

Standard of California tanker being loaded through Pioneer Oil Suction and Discharge Hose.

Most of America's best products spring from an interchange of ideas between the *user* and the *manufacturer*. Pioneer Oil Suction and Discharge Hose is the result of years of cooperation between engineering departments in the oil industry and our own laboratory and factories. This hose, as now used by Standard of California, for example, gives far longer service and helps speed tanker loading up to 20,000 barrels an hour!

Whether you want an industrial rubber product built to your specifications, or need the recommendation of experienced technicians, call on Pioneer Rubber Mills. Apply Pioneer's engineering experience and building facilities to the industrial rubber products you use, and you will get the *extra* service that Pioneer customers know so well. Just call your nearest Pioneer representative.

"How to LENGTHEN the life of industrial rubber goods"

This booklet gives you hundreds of down-to-earth suggestions on how to get better service from all kinds of industrial rubber products. You'll profit from the subject matter, and you'll be amused by the colorful illustrations. Whether you are yet a Pioneer customer or not, just drop a post card asking for "Lengthen Life" booklet. Address: Pioneer Rubber Mills, 345-353 Sacramento Street, San Francisco 11, California.

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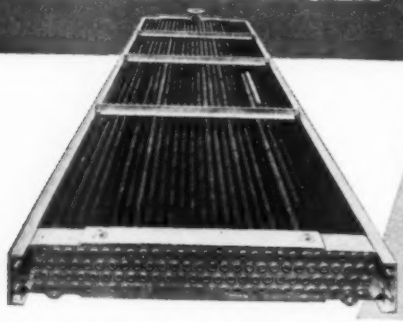
MAIN OFFICE: 345-353 SACRAMENTO STREET, SAN FRANCISCO 11
FACTORIES: PITTSBURG, CALIFORNIA

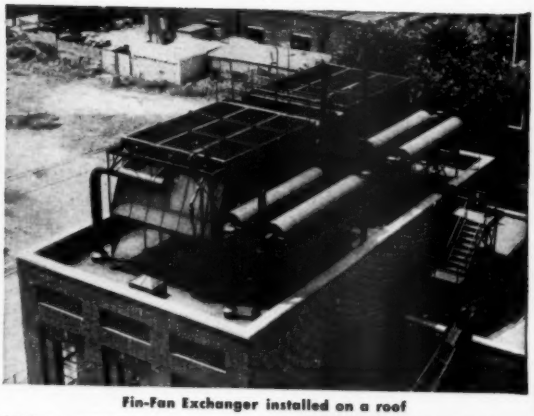
FIN-FAN
AIR-COOLED
HEAT EXCHANGER



A

G-R K-Fin Air-Cooled Sections used in the Fin-Fan Exchanger

Fin-Fan Exchanger installed within a building



Fin-Fan Exchanger installed on a roof

Large Fin-Fan installation on the ground

GRISCOM-RUSSELL

AIR...the only cooling and condensing medium that's...

- **FREE**
- **LIMITLESS**
- **UNIFORM**
- **DEPENDABLE**

Every plant designer, construction engineer and maintenance man knows the expenses, complications, and difficulties of water-cooled heat exchangers . . . the required piping, pumping, treatment and disposal . . . the likelihood of corrosion, scaling and freeze-ups . . . the uncertainty of sustained adequate supply.

All these problems are being avoided by plants in every section of the country which use AIR as the cooling or condensing medium . . . in FIN-FAN Air Blast Exchangers.

These exchangers, developed jointly by The Griscom-Russell Co. and Fluor Corp. Ltd., are self-contained package-type units. They include G-R K-Fin Heat Transfer Sections with Fluor air circulation equipment, all mounted in a sturdy compact structure.

You can use Fin-Fan Exchangers on practically any cooling or condensing service. You can put them anywhere . . . on the ground, on a roof, or within a building. You can use a single installation for two or more heat transfer duties.

And these are only some of the many Fin-Fan benefits and advantages. Get the whole story of this important development in heat transfer apparatus . . . write for bulletin and ask for specific recommendations on Fin-Fan for your cooling and condensing needs.

Some of the many services on which FIN-FAN EXCHANGERS are being used

- Exhaust steam condensing
- Engine jacket water cooling
- Engine oil cooling
- Oil cooling for large gear boxes, speed reducers, etc.
- Gas compressor inter and after cooling
- Process gas cooling
- Solution cooling
- Quenching oil cooling
- Still reflux condensing
- Final overhead condensing and cooling
- Refrigeration system condensing
- Gas treating and purification system condensing and cooling

THE GRISCOM-RUSSELL CO., MASSILLON, OHIO

GR-257

GRISCOM-RUSSELL: PIONEERS IN HEAT TRANSFER APPARATUS

ATTAPULGUS Fullers Earth
POROCEL Activated Bauxites

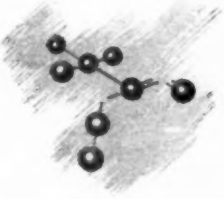
...two reliable names along the path of petroleum processing

WHAT DO YOU WANT TO PURIFY?

There's an Attapulgus or Porocel adsorbent to fit your process technique for removing odors, colors, tastes, moisture, acids, sulfur, fluorides and unsaturates from process liquids or gases. Materials treated in principal applications are: motor oils and other lubricating, specialty, and technical oils; petrolatums and waxes; aviation and motor gasoline stocks; kerosene; diesel and heating oils.

DO YOU HAVE CATALYST OR CATALYST CARRIER NEEDS?

Attapulgus or Porocel sorptive minerals are recognized standards in desulfurization, reforming and isomerization systems—catalytic removal of unsaturates—conversion of sulfides to elemental sulfur—fluid catalyst applications—as catalyst carrier in copper sweetening processes.



WHAT DO YOU WANT TO DRY?

We offer a wide range of reliable, thoroughly proved desiccants for drying air, hydrogen, carbon dioxide, hydrocarbon liquids and gases.

SPECIAL GRADES?

Mine and plant facilities permit prompt and economical production of grades meeting individual customer specifications. Our laboratories and technical staffs welcome the opportunity of assisting in research, development, design and operating problems. Your inquiries are invited.

ATTAPULGUS CLAY COMPANY *Fullers Earth* · **POROCEL CORPORATION** *Activated Bauxites*

Dept. V, 210 West Washington Square, Philadelphia 5, Pa.

COLUMBIAN STEEL TANK CO. KC MO
COP-NIC
A COPPER NICKEL ALLOY
TANKS FOR THE WORLD

COLUMBIAN
BOLTED STEEL TANKS

The Columbian Trade Mark is internationally known as a dependable guide to bolted steel tanks that give extra value in long-life, low-cost service in oil fields all over the world! Precision engineered from quality steel, Columbian Tanks are easily assembled by unskilled labor. They give you the extra advantage of many Columbian exclusive construction features.

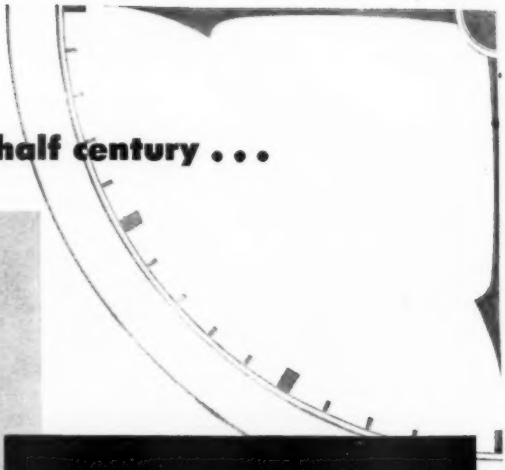
Columbian Bolted Steel Tanks are available now for oil producers. Columbian COP-NIC Tanks, especially for sour crude, will be available when conditions permit.

• **Columbian All-Metal Buildings** are ideal for warehouses, engine houses, garages, equipment and storage houses. Rigid, strong, fire-safe, low upkeep.

COLUMBIAN STEEL TANK CO., P. O. Box 4226-H, Kansas City, Mo.

Now a new name

to start our second half century . . .



CHICAGO
METAL HOSE
CORPORATION

Flexonics Corporation

Sales operations are divided into four logical divisions

CHICAGO METAL HOSE DIVISION

Corrugated and convoluted flexible metal hose, machine tool conduit, refrigeration conduit, "Vibra-Sorber" vibration eliminators for piping, and assemblies for specific applications.

AIRCRAFT DIVISION

Stainless steel aircraft components including hose of all types, bellows, oil and fuel lines, air lines, ducting and connectors of all types and many special assemblies for jet aircraft.

FLEXON BELLOWS DIVISION

Stainless steel bellows, brass and bronze bellows, automobile thermostats and bellows and bellows assemblies and devices for all types of standard and specialized applications.

EXPANSION JOINT DIVISION

Standard corrugated packless type expansion joints in free-flexing and controlled-flexing construction, high pressure Flexoniflex expansion joints, heat riser expansion joints, and special joints.

• In 1947, Chicago Metal Hose Corporation introduced to industry a new science—the science of Flexonics. It is defined as the controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion. This definition so well describes our operations and the expanding range of our products that we are adopting it as our corporate name coincident with our 50th anniversary year.

Let us assure you, however, that the change from Chicago Metal Hose Corporation to Flexonics Corporation involves no change in management, personnel or methods of operation except for internal organizational changes that will make it possible for a fast growing company to serve its customers better.

Flexonics *Corporation* **1345 S. THIRD AVENUE · MAYWOOD, ILLINOIS**

FORMERLY CHICAGO METAL HOSE CORPORATION

Flexon identifies CMH products that have served industry for over 50 years.

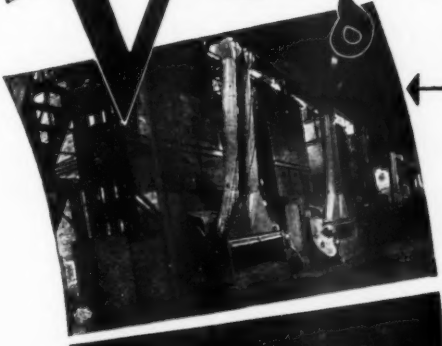
Manufacturers of Convoluted and Corrugated Flexible Metal Hose in a Variety of Metals • Expansion Joints for Piping Systems • Stainless Steel and Brass Bellows • Flexible Metal Conduit and Armor • Assemblies of These Components

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

USE THESE BETTER

Vogt Products

For Today's Tough Service Demands

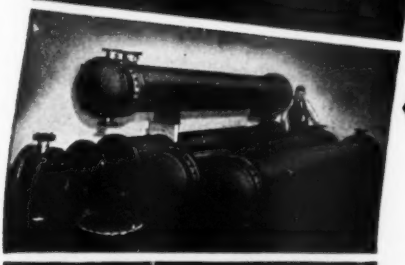


EFFICIENT AND DEPENDABLE STEAM GENERATION

Vogt steam generating units are designed to give maximum rating in a minimum of space with high efficiency and low maintenance expense. Bent tube types and straight tube, forged steel sectional header types to burn solid, liquid or gaseous fuels, as desired, meet every power, heating or process requirement.

PROCESS EQUIPMENT FOR EVERY SERVICE

Stills, towers, oil chilling machines, filter presses, heat exchangers, etc. are constructed to all Codes. They meet all demands for operating security and trouble-free performance and help to lower costs in important process industries around the world.

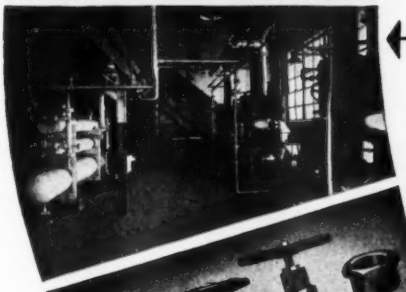


SPECIAL MATERIALS FIGHT CORROSION AND PRODUCT CONTAMINATION

Our modern shops produce a wide variety of equipment made from special metals and alloys to combat corrosion, and product contamination or discoloration. Fabrication procedures employed insure that corrosion resistant properties of welds will match that of the materials from which units are constructed.

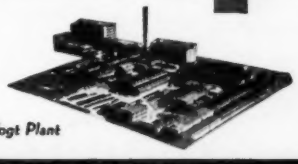
MORE TONNAGE AT LESS COST

Over 60 years of manufacturing experience, engineering and research stand behind Vogt refrigerating and ice making machinery. Absorption Systems, Compression Systems, and the Automatic Tube-Ice Machine in a wide range of capacities serve in leading petroleum refineries, chemical plants, ice and cold storage plants, dairies, packing plants, etc., at home and abroad.



DROP FORGED FOR EXTRA TOUGHNESS AND LONG-TIME SERVICE

Vogt valves, fittings and flanges, for top performance in oil, water, air, gas, and ammonia services, at high or low pressures and temperatures, are available drop forged entirely from carbon steel or stainless steel. Valves can be furnished in a combination of materials by using stainless steel for parts affected by service temperature or corrosion, and less expensive alloys or carbon steel for other parts.



Air View of Vogt Plant

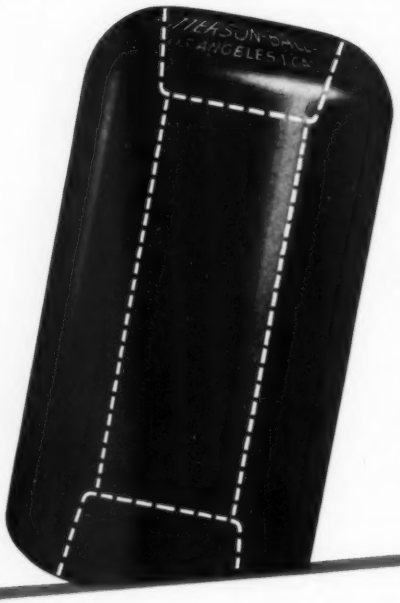
HENRY VOGT MACHINE CO.

LOUISVILLE 10, KENTUCKY

BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS

PB Relieved End CASING PROTECTORS

... give extra shock and tear resistance where it's needed most!



1. RUGGED! PB's *relieved end* design puts extra grip in the center—takes the stress off the ends—*gives extra shock and tear resistance where it's needed most.* PB's field proven rubber holds up under the toughest drilling conditions—withstands deepest drilling temperatures!

2. SPEEDS UP DRILLING. Field records show that PB Protectors cut friction, torque and power waste . . . allow higher drilling speeds . . . permit more accurate control of weight on the bit.

3 FULL PROTECTION for your drill pipe and casing. *Sure grip* PB Protectors stay as installed—will not slip.

Write today for 1952 catalog.

PB casing protectors installed from transfer sleeve to drill pipe in less than 4 seconds!

Our man can install PB Protectors while you make up or run pipe. No down-time while adding protectors—big savings for the rig operator!

Call your local PB representative today for a demonstration of this faster hydraulic installation equipment—available only with PB.

PB DIVISION
BYRON JACKSON CO.
MAIN OFFICE: 1900 EAST 65TH STREET
LOS ANGELES 1, CALIFORNIA

Here's a blueprint FOR INCREASING SPEED AND REDUCING WORRY

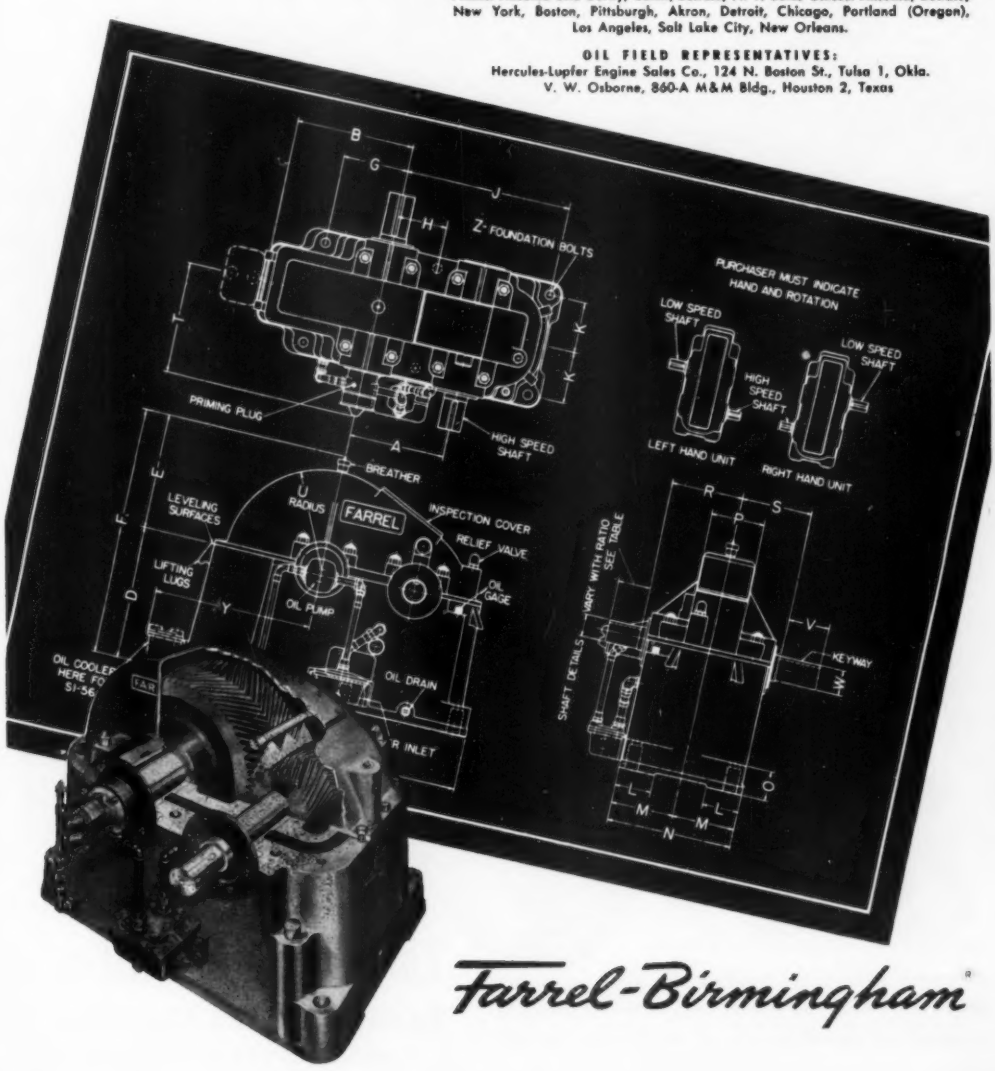
In 1932, Farrel developed a series of speed increasers which has taken at least some of the worry out of pipeline pumping station operation. For, of the hundreds of units installed in the oil industry since then, ***not a single one has ever failed in service.***

In view of this exceptional twenty-year record, you can feel confident that your own worries will be reduced when you specify *Farrel speed increasers.* These units are available in 49 standard sizes, with speed ratios ranging from 1:1 to 12:1. For higher ratios, units using two sets of gears are supplied with ratio range from 12:1 to 40:1.

For further information about these service-proved speed increasers, write for your copy of Bulletin No. 448A. No cost or obligation.

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONN.
Plants: Ansonia and Derby, Conn., Buffalo, N. Y. *Sales Offices:* Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Detroit, Chicago, Portland (Oregon), Los Angeles, Salt Lake City, New Orleans.

OIL FIELD REPRESENTATIVES:
Hercules-Lupfer Engine Sales Co., 124 N. Boston St., Tulsa 1, Okla.
V. W. Osborne, 860-A M&M Bldg., Houston 2, Texas



Farrel-Birmingham

CHAPMAN

Steel Valves Score on all 3 Points

1

CHAPMAN STEEL VALVES have the high precision ratings of custom-made valves — but the economy of production-line manufacture.

2

CHAPMAN STEEL VALVES are made exclusively from quality-controlled steels developed and produced in Chapman's own foundries under control of Chapman's own outstanding metallurgists.

3

CHAPMAN STEEL VALVES are designed to equal or surpass — A.S.A. and A.P.I. Standards in all pressures and temperature ranges.

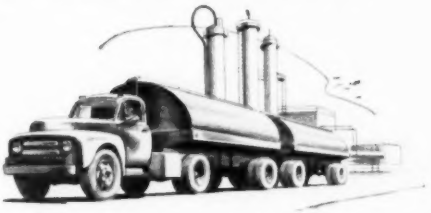
Be sure to see Chapman first whenever you need steel valves — gate, globe, angle or check. As a result of Chapman's long years of research and experience, they are tops in every respect.

The Chapman Valve
MANUFACTURING COMPANY
INDIAN ORCHARD, MASS.

the RIGHT gear ratio for load, road, and type of service

means more and faster trips, lower cost, longer truck life

EATON 2-Speed Axles *double* the conventional number of gear ratios, giving drivers a *right* ratio for every operating condition—on the highway, or off, starting out under full load, climbing grades, highballing, quick shifting in traffic. Engines run in the most efficient and economical speed range, reducing stress and wear on engines and power transmitting parts; adding thousands of miles to vehicle life. And Eaton Axles last longer because exclusive planetary gearing better distributes gear tooth loads. The exclusive Eaton forced-feed oiling system provides positive lubrication at all vehicle speeds. Ask your dealer to show you how Eaton 2-Speeds will help *your* trucks haul more, faster, longer, at lower cost!

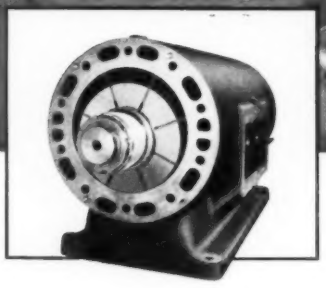


Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

EATON *2-Speed Truck* AXLES

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

keep pressures up and upkeep down



Three two-stage Natural Gas Boosters in operation near Stinnet, Texas. Each direct-driven by a gas engine at 800 rpm., handles 1,770,000 SCFD, and boosts pressure from 10 to 120 psig.

Once again, Fuller Rotary Compressors have been chosen to give natural gas a king-sized boost. Texas gas men know when they install a Fuller Compressor that upkeep is low . . . that they'll get a life-time of dependable, continuous service.

There are no valves or other complicated mechanism in a Fuller Rotary Compressor. Moving parts—rotor, bearings, and blades—are few. Vibration-free, pulsation-free, and free from bearing take-up! Blades automatically compensate for wear, thereby insuring full compressor capacity for the life of the machine. It all adds up to one of the simplest and most efficient compressors available.

Fuller engineers are ready to offer estimates and plans for any compressor installation, whether for gathering lines or for general booster work. Write for Bulletin C-5 for complete information on Fuller Rotary Compressors.

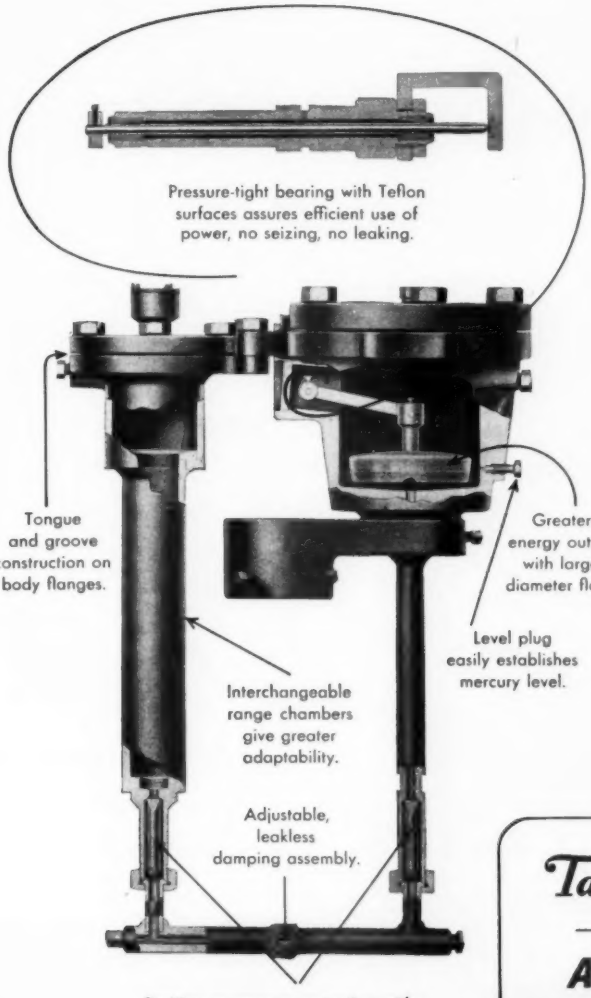
FULLER COMPANY, Catasauqua, Pa.
120 So. LaSalle St., Chicago 3
420 Chancery Bldg., San Francisco 4

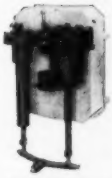
fuller

C-207

Taylor Mercury Manometer

DOESN'T SEIZE, DOESN'T LEAK!


Pressure-tight bearing with Teflon surfaces assures efficient use of power, no seizing, no leaking.
Tongue and groove construction on body flanges.
Greater energy output with large diameter float.
Level plug easily establishes mercury level.
Interchangeable range chambers give greater adaptability.
Adjustable, leakless damping assembly.
Positive overrange protection with mercury-submerged Nylon check valves.



HERE's a mercury manometer that's ideal wherever you need something *better* than conventional flow, liquid level and other differential pressure measuring instruments. Check these features:

Greater accuracy results from greater power of extra-large float efficiency transmitted by mirror-finished shaft and Teflon bearing; also straight line calibration.

Greater adaptability, thanks to six interchangeable range tubes (*10", 20", 50", 100", 200" and 400" of water*) which, except 10", may be over or under ranged 33⅓%.

Maintenance is easy, because the low pressure chamber cover permits easy access to float and lever arm during calibration, and the entire pressure tight bearing can be easily, economically replaced.

Performance is dependable, because the submerged check valves give positive shutoff, damping valve is adjustable under full pressure, and there's ample room in the mercury chambers to accommodate surges.

This is just one of many Taylor Instruments to measure, record and control practically any process variable with new high accuracy and dependability. *Write for Catalog 98175* or ask your Taylor Field Engineer how Taylor can help you cut cost, protect your product quality. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

FISHER...

AUTOMATIC CONTROLS
STOCKED BY

VINSON

FOR

Oil Refineries • Gasoline Plants • Oil Production • Gas Distribution Systems • Power Plants • Related Industries

The Fisher Governor Company is the world's largest manufacturer of control equipment. To back up these tremendous production facilities Vinson Supply Company carries large stocks at Tulsa, Dallas, Odessa and Snyder.

Call Vinson to take care of your control problem from inception to final servicing.

OTHER VINSON LINES

Crane Valves • Nordstrom Valves • Ladish Welding Fittings and Flanges • Chase Brass Condenser Tubes • National Pipe and Steel Tubes

VINSON • DALLAS

Vinson Supply COMPANY first

TULSA – 5-6681, L.D. 717
DALLAS – Dixon 3983
ODESSA – 6-4351
SNYDER – 1148

with BUTLER
Bolted Steel Oil Tanks

Butler Walkways and Stairways, shown here on this battery of Butler Bolted Tanks, add safety, strength and flexibility to any installation. The next time you buy Butler Bolted Tanks, specify Butler Walkways and Stairways, too.

Extra care... extra skill that Butler puts into the engineering and fabrication of bolted tanks is your assurance of dependable storage. Each tank part is accurately engineered. Each tank sheet is formed on precision dies with precision punching to insure an oil-tight fit and faster, easier erection. Electrostatic painting gives each section uniform protection.

The next time you need a single tank or a battery—call your Butler distributor.

and You'll Always Get Dependable Service from Your Butler Distributor

Your Butler distributor is ready to give you dependable service on Butler Bolted Steel Tanks, Walkways and Stairways, Unit Heaters and other oil field equipment.

AMERICAN PIPE & SUPPLY COMPANY
Casper, Wyoming · Denver, Colorado · Cut Bank, Montana

HARRY G. MILLER
El Dorado, Arkansas

UNION TANK & SUPPLY COMPANY
Fort Worth, Texas · Houston, Texas · Odessa, Texas · Snyder, Texas
Alice, Texas · Tyler, Texas · Midland, Texas · Nocona, Texas
Abilene, Texas · LaFayette, La. · Ruston, La. · New Orleans, La.
Great Bend, Kansas · Tulsa, Okla. · Oklahoma City, Okla. · Hobbs, New Mexico

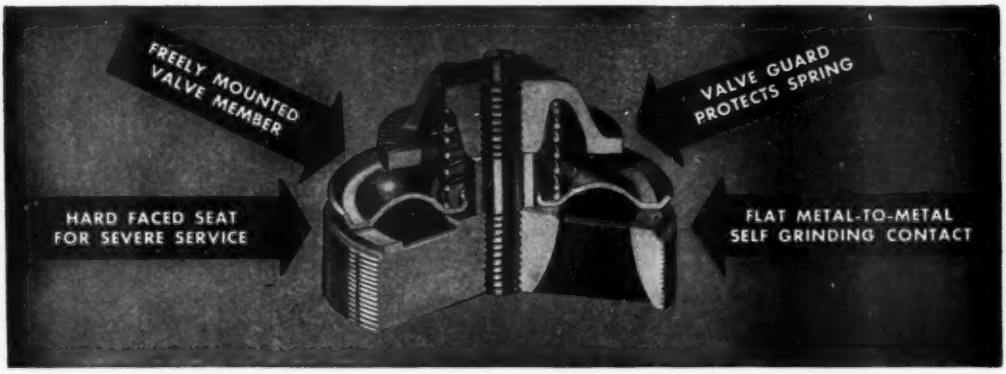
W. H. CONNOR, INC.
Denver, Colorado · Sterling, Colorado · Casper, Wyoming · Powell, Wyoming

BUTLER

BUTLER MANUFACTURING COMPANY
Kansas City, Mo.
Galesburg, Ill. · Richmond, Calif. · Birmingham, Ala. · Minneapolis, Minn.

DURABLA

METAL PUMP VALVE UNITS
KEEP YOUR PUMPS IN SERVICE


FREELY MOUNTED VALVE MEMBER
VALVE GUARD PROTECTS SPRING
HARD FACED SEAT FOR SEVERE SERVICE
FLAT METAL-TO-METAL SELF GRINDING CONTACT

1 **THEY ARE SELF-GRINDING:** Durabla Valve Units*, utilizing the freely mounted arched construction valve member exclusive to Durabla, are self-grinding, as the flat portion of the valve member is in direct contact with the flat valve seat and is free to move about its axis, thus producing a constant self-grinding action.

2 **VALVE SEATS ARE HARD FACED FOR SEVERE SERVICE:** Providing a seat surface hardness of Rockwell C-48-52 (approximately 500 Brinnel) or more in special valves, Durabla Valve Units have a long record of effective service with FLUIDS CARRYING SUSPENDED ABRASIVE SUBSTANCES. The metal valve member effectively prevents the pitting or "pick-up" of abrasive substances sometimes occurring with valves made of other materials.

3 **VALVE SPRINGS AND VALVE STEMS ARE PROTECTED:** The Valve Guard protects the Valve Spring from ever compressing more than 50% of its length. The Valve Stem is protected against breakage by the free mounting of the Valve Member.

Economy, efficiency and adaptability, based on long established service records and exclusive design make Durabla Valves your guarantee of reliable, uninterrupted pump operation.

You can specify Durabla Valves when you order a pump, (many manufacturers use them as standard equipment), or you can order Durabla Valves to fit any type of reciprocating pump, (they come with drive-fit seats or threaded seats with or without a shoulder to suit the job).

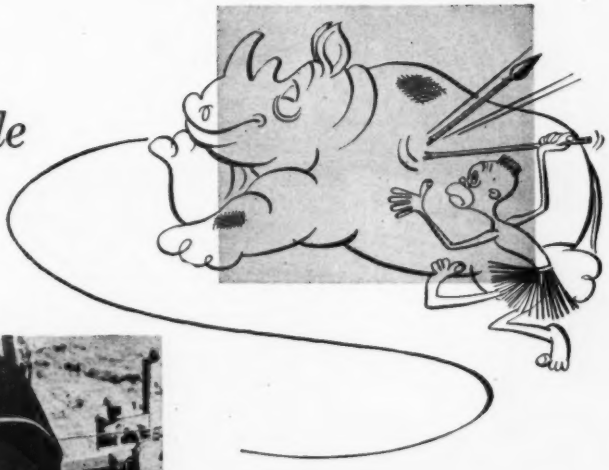
TO AVOID "PUMP TROUBLES" SPECIFY DURABLA VALVES

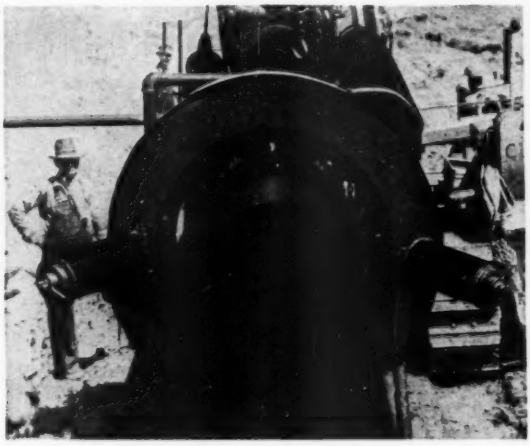
Address DURABLA Engineering Department for information and bulletin: Reference OG-1

*Patent Numbers 2090486, 2117504

DURABLA MANUFACTURING COMPANY
114 LIBERTY ST. NEW YORK
BRANCHES IN PRINCIPAL CITIES. FOR CANADA REFER: CANADIAN DURABLA LIMITED, TORONTO

Like the Rhino's tough hide that protects what's inside...





Johns-Manville Asbestos Felt protects oil and gas pipe lines

MORE than 100,000 miles of oil and gas pipe lines are now protected by Johns-Manville Asbestos Pipeline Felt—*the only type of wrapper that has survived over 50 years of service in all types of soils.*

Johns-Manville Asbestos Felt is a sturdy, inorganic product. It has the thickness and toughness necessary for shielding pipeline enamels from earth load and soil stresses. It is resistant to rot and decay, and to acid and alkali soils. It permits the protective enamel coating to properly function against corrosion.

Johns-Manville Asbestos Felt is flexible. It wraps easily without cracking. It guards enamel from impact during installation of field-wrapped pipe, or during transportation and installation of mill-wrapped pipe.

There are economic advantages, too. In addition to reducing maintenance expense, Johns-Manville Asbestos Felt adds many years of life to the pipeline. For further information and a sample of Johns-Manville Asbestos Pipeline Felt, mail the coupon below.

Johns-Manville
Asbestos
PIPELINE FELT

Johns-Manville
Box 290, New York 16, N. Y.
Please send me a copy of the sample folder on Johns-Manville Asbestos Pipeline Felt, PP-22A.

Name_____

Address_____

City_____ Zone____ State_____

ENGINEERED. . .FIELD PROVEN...

STANDARD Lufkin PRACTICE

SIDE MEMBERS

DURABILITY
Heavy pipe construction—continuously welded to give maximum strength and capacity. Jig welded for accuracy and interchangeability.

ALIGNMENT
Ball and socket crank pin connection giving automatic immediate alignment.

SIMPLICITY
Few parts—single bolt latch for disconnecting—smooth appearance.

LUFKIN GIVES YOU the best in materials and design possible for our engineers to pack into each component part. Every part is made to be tough, so it will stand up under the toughest service—but easy to maintain. Note the features of these Lufkin assemblies which help to make Lufkin first in service, safety, dependability and efficiency.

SAMSON POSTS

FABRICATION
Jig welded to insure interchangeability.

STRENGTH
Designed for rigidity with considerable reserve load carrying capacity.

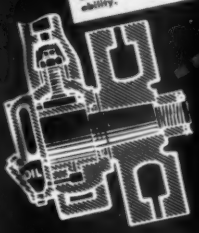
MATERIAL
The samson posts are made from wide flange beam sections.

PITMAN BOX

CAPACITY
Bronze bushed with large bearing area to carry heavy loads.

TROUBLE FREE
Oil bath, dust proof construction with breather which allows moisture to escape. This eliminates oil contamination and costly repairs.

CRANK PIN FIT
The taper ground crank pin and the crank pin hole are checked with precision gages insuring a perfect fit and interchangeability.



BASES

MATERIAL
Bases are made from wide flange beam sections with stiffeners to give extra rigidity where the most weight is concentrated.

INSPECTION
Each base is template drilled and thoroughly inspected before it leaves the plant.

VARIETY
Bases are made to fit every type of prime mover and can be furnished with or without sub bases.

LUFKIN FOUNDRY & MACHINE COMPANY

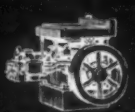
LUFKIN, TEXAS

Branch sales and service Houston, Dallas, New York, Tulsa, Los Angeles, Seminole, Oklahoma City, Corpus Christi, Odessa, Kilgore, Wichita Falls, Casper, Wyoming; Great Bend, Kansas.

Lufkin Equipment in CANADA is handled by

THE LUFKIN MACHINE CO., LTD., 14321 108th Avenue, Edmonton, Alberta, Canada.

LUFKIN PUMPING UNITS



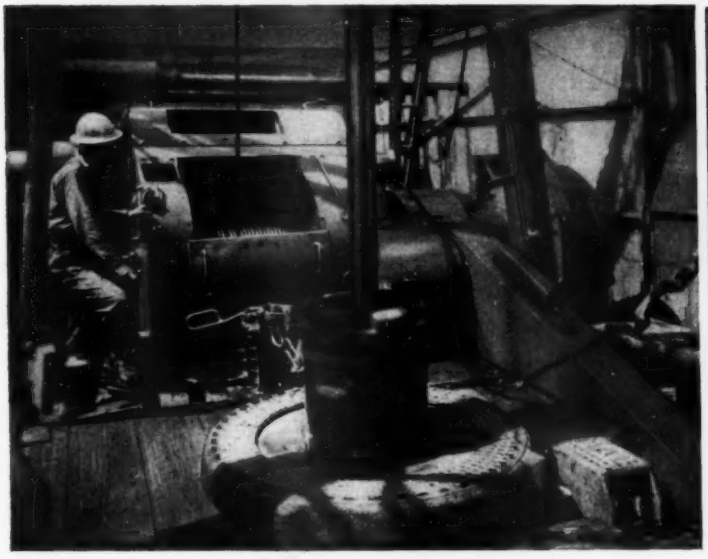
LUFKIN-COOPER-BESSEMER ENGINES

LUFKIN OIL FIELD AND INDUSTRIAL TRUCK TRAILERS

INDUSTRIAL SPEED REDUCERS AND INCREASERS

DIVISION LUFKIN FOUNDRY & MACHINE COMPANY INDUSTRIAL MILL AND AUTOMOTIVE SUPPLIES

WIRE ROPE



ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices . . . have the full strength of the rope. Send for the full story.

In the oil fields Roebling "Blue Center" Preformed is tops for service and savings

"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. It has to pass the most stringent tests for strength, fatigue and abrasion resistance . . . gives rope the extra long life that spells important economies. Besides, Roebling Preforming assures you top performance on the job. "Blue Center" Preformed is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping.

Roebling makes a complete line of wire rope . . . makes the right grade, and construction for every installation. Have your Roebling Field Man help choose the *right* rope for your equipment. Get his advice on the correct use and maintenance of wire rope. It is based on performance records on thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

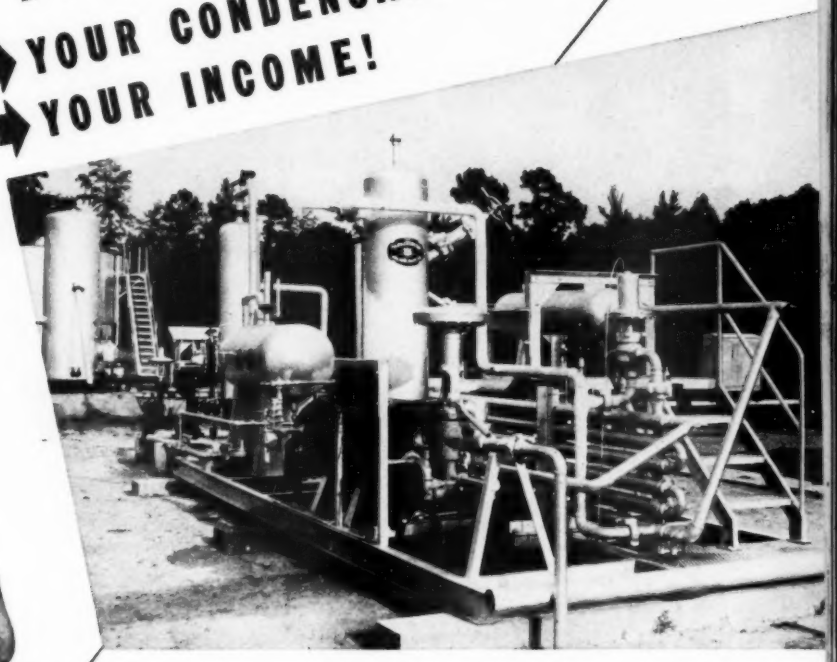
ROEBLING

DISTRIBUTED BY THE NATIONAL SUPPLY COMPANY
REPUBLIC SUPPLY COMPANY

INCREASE...

YOUR CONDENSATE RECOVERY!

YOUR INCOME!



with PARKERSBURG HYRECO

● You can add hundreds of dollars per month to your revenue from gas wells by increasing condensate recovery with the PARKERSBURG HYRECO WELLHEAD PROCESSING UNIT. That's the record made by operators who have Hyreco units on their high pressure gas wells.

Only the Parkersburg Hyreco gives you this kind of performance, consistently. It is the only method of cold separation that successfully removes water from the gas stream at wellhead pressure, thus eliminating the necessity of introducing large volumes of water into the cold separators. Hyreco frequently increases condensate recovery by more than 5 to 15 barrels per million feet sold . . . eliminates costly downtime due to freezing . . . normally eliminates the need for dehydration units to prepare gas for pipe line delivery.

To suit your particular needs or desires, Parkersburg Hyreco offers you the option of 3 basic cold separation process assembly arrangements.

Ask your Parkersburg Representative to show you comparative records that prove Hyreco increases condensate recovery . . . increases your earnings.

PARKERSBURG RIG AND REEL CO.
Parkersburg, West Va.

No. 5118

PARKERSBURG

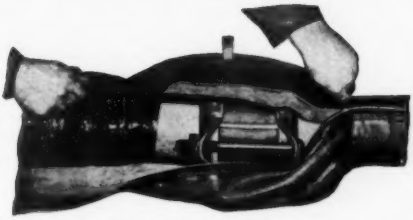
PRESSURE EQUIPMENT

HORIZONTAL AND VERTICAL SEPARATORS • HYRECO • HYDRACEPTER • SCRUBBERS • TREATERS • HEATERS

Manufactured in Houston, Texas

Now—you simply "pull the zipper" on corrosion problems

Dresser ZIPCOAT for welded joints zips over weld area, fits closely to the pipe. 30" lengths.



Dresser ZIPCOAT for couplings is easy to install over joint and pipe ends—all in one quick operation. Has bleeder valve to vent air during backfilling.

NEW DRESSER ZIPCOATS* GIVE SURE PROTECTION, SUPERLATIVE DIELECTRIC STRENGTh

"As easy as zipping up a jacket" is what workmen say about Dresser's new ZIPCOATS. They install ZIPCOATS in 1/10 of the time it takes to coat a joint. You get protection that equals or exceeds that offered by the mill or yard-wrapped pipe.

And look at the hazards you avoid: there's no flame; no heating, hauling or messy application of hot stuff; no danger from fumes or burns.

Can be installed in any weather.

Write today for descriptive material and price list.

*Every ZIPCOAT complete with anaerobic microbiological corrosion inhibitor and cold sealing compound. ZIPCOAT is a trade mark of Dresser Manufacturing Division.

Dresser ZIPCOAT for insulating joints is made like the ZIPCOAT for welds, but in ten-foot lengths. Installing one on each side of an insulating joint that's protected with a ZIPCOAT for couplings gives ultimate protection. Eliminates costly boxing and filling with dope. Immediate trench backfill saves time.

Install Dresser Insulating Couplings IN MINUTES

Dresser Style 39 Insulating Couplings with new plastic gaskets insulate effectively and are the simplest insulating type joint to install. Sizes ¾" to 30" and up.

New Dresser Bonding Method saves up to 50% of cost; materials preformed

Fast bonding, giving low resistance with *pre*formed Dresser Bond and 5-second chemical welding method. Needs no special skill, no bulky equipment. Makes homogeneous weld area, eliminates surface contact variables. Compact kit of 50 *pre*formed bonds includes all materials needed for installing.

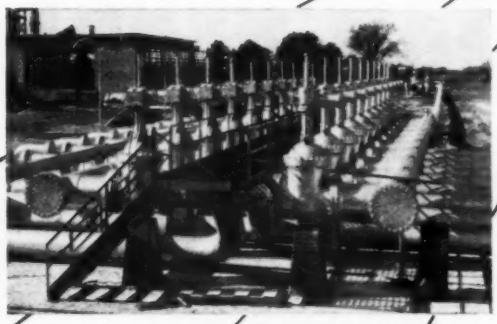
DRESSER

MANUFACTURING DIVISION

Headquarters: Bradford, Pa. (One of the Dresser Industries). Sales Offices: New York, Philadelphia, Chicago, Houston, San Francisco. In Canada: 629 Adelaide St., W., Toronto, Ontario.

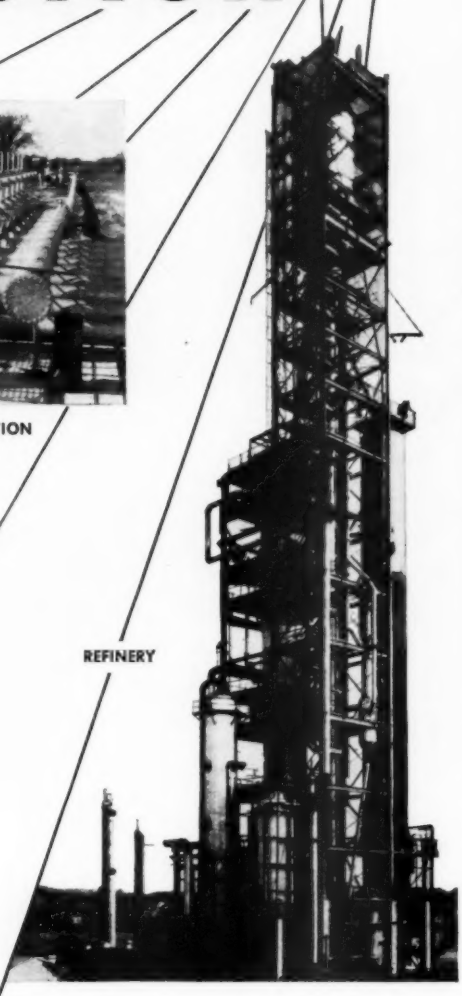
GRAVER

CONSTRUCTION



PUMPING STATION

BLENDING PLANT



REFINERY

Graver Construction Service provides the skill and facilities to cover full responsibility for the engineering, procurement, and erection requirements of refineries, blending plants, pumping stations, and pipe line terminals. This complete service applies to installation of new facilities . . . expansion of existing equipment . . . maintenance and repair.

GRAVER CONSTRUCTION CO.

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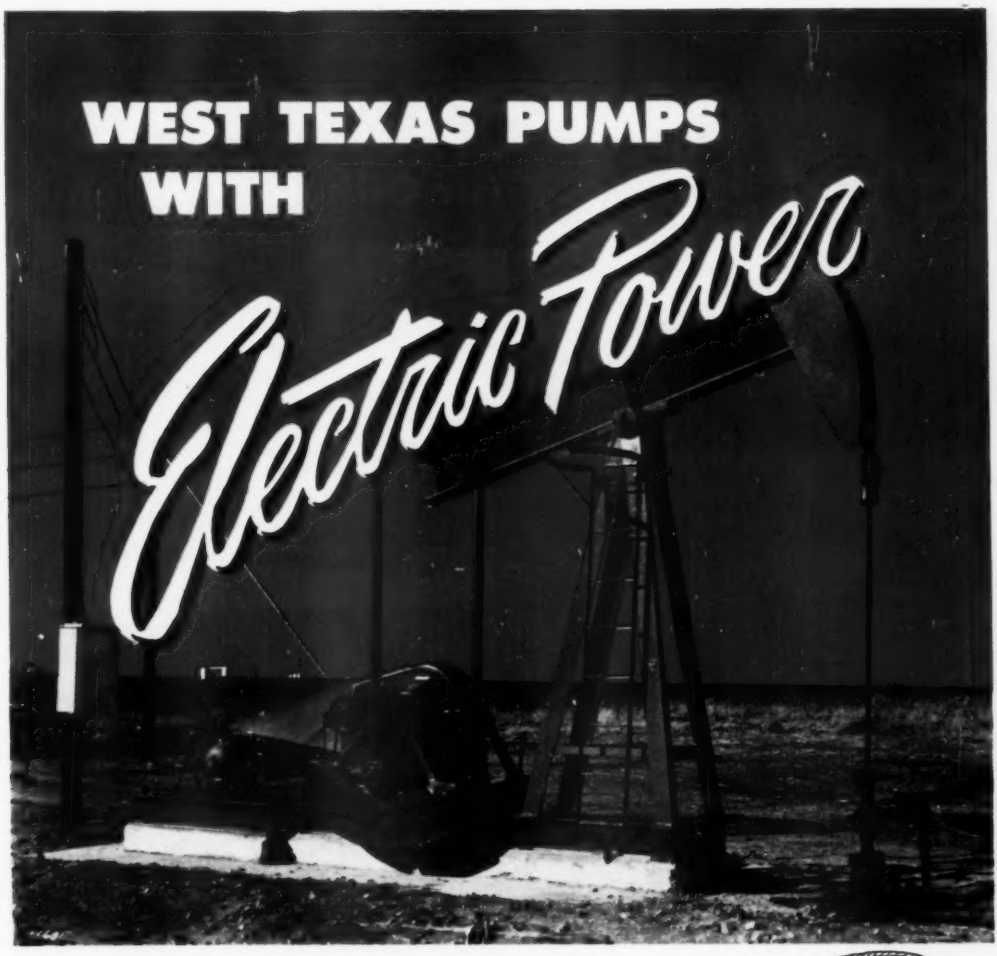
NEW YORK HOUSTON

A DIVISION OF

GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, IND.

WEST TEXAS PUMPS WITH *Electric Power*



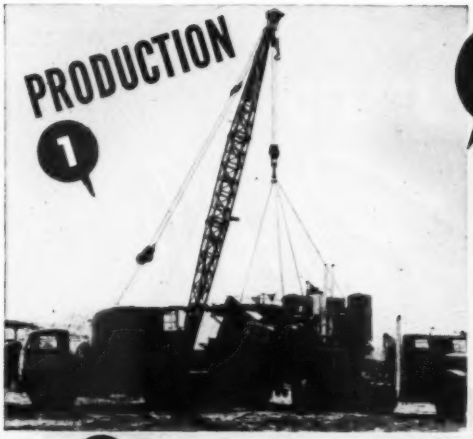
In the fabulous West Texas Area, dependable power is a requisite. Pictured here is one of an 82-well field near Levelland, Texas, PUMPED BY LOW-COST ELECTRIC POWER. Throughout this area — as well as practically all other producing areas — Purchased Electric Power is being used because of its all around better performance and economy. The Power Engineer of your nearest Electric Power Company has all the facts. Let him help you *cut* your power bills and *get more* for your power dollar.

Petroleum Electric Power Association

ORGANIZED IN THE INTEREST OF GREATER SERVICE TO THE PETROLEUM INDUSTRY

CALL YOUR NEAREST ELECTRIC SERVICE COMPANY FOR MORE FACTS

OR ADDRESS YOUR REQUEST TO P. O. BOX 2771, DALLAS, TEXAS



4 SURE CURES for Oilfield Problems

■ Lorains proved to be the *best answers* to these four oilfield problems. They cover just about every phase of operation . . . *drilling, refining, pipelining* and *stringing*. Proving this point . . . Lorain offers *unlimited selection* of capacities, mountings and front end types to meet the many and varied needs of the petroleum industry, for production, refinery and transmission. The Lorain line includes 6 turntable "series" in many capacities, on crawler or rubber-tire mountings, with 5 interchangeable booms for any digging, lifting or material handling need. You can be *sure* a Lorain will pay its way . . . and there's *sure* to be a Lorain to fit your need!

THE THEW SHOVEL CO., LORAIN, OHIO

1 PROBLEM: *Loading a heavy draw works for transportation to field location.* Lacey Trucking Co., Bakersfield, California, owners of 2 Lorains, finds many jobs like this one for their mobile, 30 m.p.h. Lorain Moto-Crane.

2 PROBLEM: *Setting a new condenser in place—removing the old one—at a refinery.* Again, a Lorain Moto-Crane moves in at this Texas refinery and makes fast, easy work of a big lift.

3 PROBLEM: *Digging a trench across a river and going on for miles cross-country.* Oklahoma Contracting Co., Dallas, Texas, owners of 6 Lorains, wades across this river with their crawler-mounted Lorain "Pipeliner Junior" on their 16-inch line between Portland and Montreal.

4 PROBLEM: *Unloading pipe from trucks—feeding stringing crews along the right-of-way.* Dunn Brothers of Dallas, Texas, take advantage of Lorain Moto-Crane mobility—to move quickly all along the line—with plenty of tractive drive to travel the rough spots.

3 FREE FOLDERS . . . FOR OIL MEN!

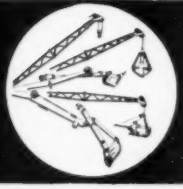
1. Lorains in the Petroleum Industry—showing applications from production to refinery.

2. Lorains on Pipeline Construction—features Lorain "Pipeliners" on nation's biggest spreads.

3. Cost Cutters of the Petroleum Industry—many job saving uses in picture and data.

Get copies from your distributor or write Thew Shovel Co.

THEW LORAIN® on CRAWLER or RUBBER



SHOVELS
CRANES
DRAGLINES
CLAMSHELLS
HOES

MARSH

... the gauge with the "Recalibrator"

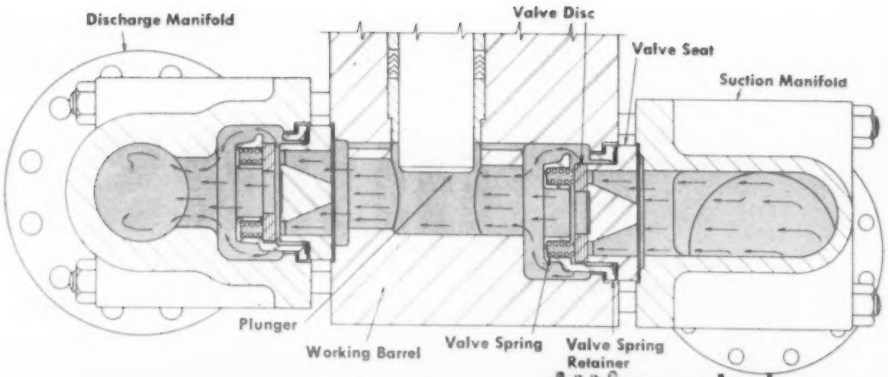
Any pressure gauge can be knocked out of adjustment, but when it's a Marsh Gauge you can quickly correct it with the twist of the "Recalibrator" screw.

This is not only the handiest way to correct a gauge; it is also the best way. Conventional methods of adjustment simply compensate for the error. The "Recalibrator" corrects the relationship between the movement and the bourdon tube—actually *does re-calibrate* the gauge.

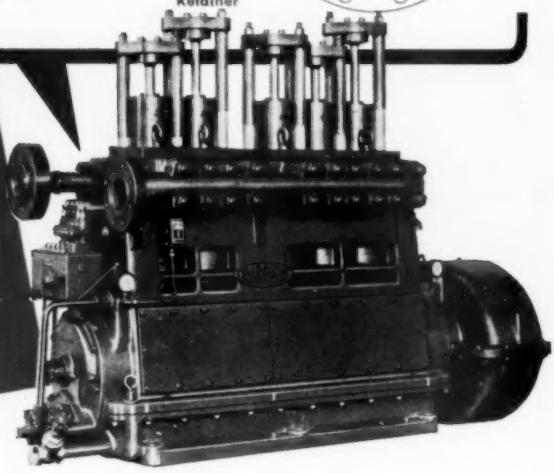
MARSH INSTRUMENT CO. Affiliate of James P. Marsh Corp. Dept. L. SKOKIE, ILL.

Export Dept.: 155 E. 44th St., New York 17, N. Y.

The Marsh line includes gauges especially designed for blenders, boilers, burners, capping, Christmas trees, columns, heaters, hydrogen units, instrument panels, pumps, Reid vapor bombs, scrubbers, separators, mud pumps, stills, towers and other applications including oxygen and welding gauges. Ask on your letterhead for new catalog just off the press.



ENGINEERS: Check these points of Aldrich Direct Flow Design



Aldrich engineers eliminated two right-angle turns in the fluid-end. Now, liquid passes from suction to discharge manifold in a *straight line.* That gave the Direct Flow Pump its name, and set up a whole new concept of pumps, pumping, and pump maintenance. It all adds up as follows:

☐ **Increased operating speeds**—you get whatever volume and pressure you need *from a smaller, lighter, more compact pump.*

☐ **Sectionalized construction**—parts can be replaced at a fraction of the cost of a new fluid-end; also, parts can be made of stainless, bronze, Monel or other special materials—extremely important for corrosive fluid service.

☐ **Maintenance made easier**—no more tapered bores in the working barrel. Manifolds are *not* taken off but slide out on studs—affording room to *lift out* valves as complete units. Packing is easily renewed—note accessibility of stuffing boxes.

☐ **Interchangeable wearing parts**—available among 3, 5, 7 and 9 plunger pumps of same stroke size. This minimizes spare parts costs and inventories.

☐ **Changeable plunger sizes**—in many cases it is only necessary to add new plungers, glands, throat bushings and packing *to the same fluid-end.*

☐ **Drive direct**—by connection to synchronous engine type motor or internal combustion engine; also with integral speed reducer or V-belts.

Contact your Aldrich Representative . . . or write to us direct for complete details on 3", 5" or 6" stroke units.

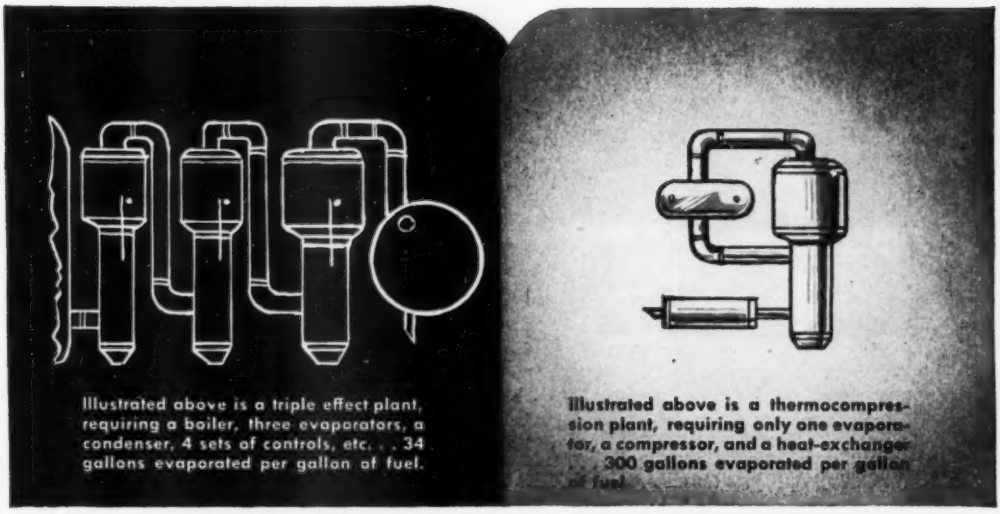
THE ALDRICH PUMP COMPANY

...Originators of the Direct Flow Pump

9 GORDON STREET • ALLENTOWN, PENNSYLVANIA

Representatives: P. H. Arden, P. O. Box 185, Glenview, Ill. • Bushnell Controls & Equipment Co., 3929 W. Jefferson Blvd., Los Angeles 16, Calif. • L. T. Gibbs, 509 Petroleum Bldg., Tulsa 3, Okla. • R. B. Moore Supply Co., Inc., Bolivar, N. Y. • Power Specialty Co., 2000 Kipling St., Houston 6, Texas • Reeves & Skinner Machinery Co., 2211 Olive St., St. Louis 3, Mo. Stearns-Roger Manufacturing Co., 1720 California St., Denver 2, Colo. • Export Sales: Petroleum Machinery Corp., 30 Rockefeller Plaza, New York 20, N. Y. • Birmingham • Boston Buffalo • Cincinnati • Cleveland • Detroit • Duluth • Jacksonville • Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. • San Francisco • Seattle • Spokane, Wash. • Syracuse

The difference between Night and Day



Illustrated above is a triple effect plant, requiring a boiler, three evaporators, a condenser, 4 sets of controls, etc. . . 34 gallons evaporated per gallon of fuel.

Illustrated above is a thermocompression plant, requiring only one evaporator, a compressor, and a heat-exchanger . . . 300 gallons evaporated per gallon of fuel.

with MECO THERMOCOMPRESSION EVAPORATORS

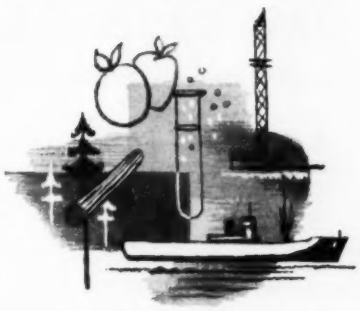
lower cost — much greater efficiency!

LOWER FUEL COST

No matter what the job is—evaporation for concentration or distilled water production—you will find that MECO thermocompression evaporators do the job better at less cost! For instance, one MECO unit is equivalent in efficiency to a 27 *effect*, multiple effect conventional plant . . . can make *pyrogen free*, chemically pure water.

LOWER OPERATION & MAINTENANCE COST

The higher the efficiency, the fewer the components, the more simple in principle the machine is—the less the cost of operation! Our brochure will describe principles of MECO thermocompression evaporation and the reasons why it will keep the operating cost of your job down, way down! MECO's working parts are so few and so easy to keep up that an average mechanic can do it with ease. High quality design insures long life.



Sea water for distillation for the oil industry . . . Concentration for the Chemical industry . . . uses in the paper, fruit juice and many other industries.

MECO

MECHANICAL EQUIPMENT CO., INC.

NEW ORLEANS, LOUISIANA

This equipment is built under various patents belonging to Mechanical Equipment Company, and Arthur D. Little, Inc.

MECHANICAL EQUIPMENT CO., Inc.
861 Carondelet St.
New Orleans, La.

Please send me bulletin concerning MECO thermocompression evaporation units.

Name _____

Address _____

FAST TRAVEL... *Anywhere!*

—thru mud, sand, dirt, snow, up grades

Imagine a high-speed, rugged truck, combining the great traction and pulling power of a crawler . . . and you have the Walter Oilfield Tractor that is revolutionizing service operations wherever installed. It speeds servicing, drilling or exploratory equipment to locations heretofore impassable for wheeled vehicles. Its big feature is the Walter 4-Point Positive Drive providing full, 100% traction in four driving wheels, eliminating wheel-spinning and slipping. Get full details.

WALTER MOTOR TRUCK CO.
1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

In Canada: Walter Motor Trucks of Canada Ltd., 46 Elgin St., Ottawa, Ontario

- 30-40 m.p.h. on normal roadways
- 125 h.p. 6 cylinder heavy duty motor
- 90 inch wheel base permits 18 ft. turning radius
- 16 inch ground clearance
- Large, single 14:00 x 20 tires
- 12,000 lb. drawbar pull at 3 m.p.h.
- 6 speeds forward, 2 reverse
- 16,000 lb. total gross weight
- Other models to 36,000 lb. g.v.w.

WALTER
4-POINT POSITIVE DRIVE
TRACTOR TRUCKS
Haul where others stall

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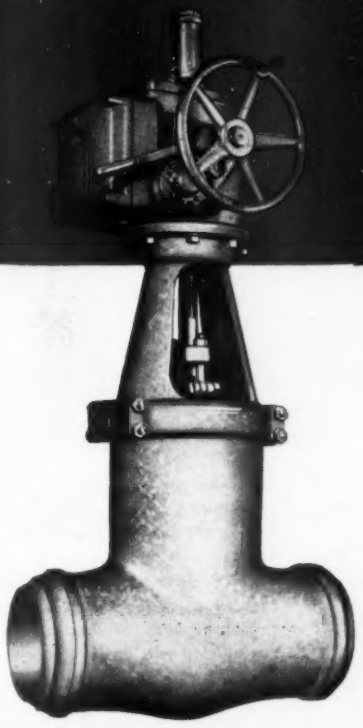
LIMITORQUE®

...the most widely used AUTOMATIC VALVE OPERATOR in the world



In all parts of the world, thousands of Limitorque Controls are in use for automatic or remote operation of valves of all types. Many of the leading Refineries and world famous Petroleum and Gas Pipe Lines are users of Limitorque Controls. Why? Because Limitorque Operators are designed to provide dependable, safe and sure valve actuation at all times.

Limitorque Controls function equally well, indoors or out . . . in any weather. A handwheel is provided for fast manual operation in case of power failure, and Limitorque can always be declutched for handwheel operation regardless of weather or electrical conditions. Any power source may be used for operation.

Our catalog L-50 illustrates and describes the Limitorque Valve operators. Write for a copy on your Business Letterhead.

Philadelphia Gear Works, INC.

ERIE AVE. AND G ST., PHILADELPHIA 34, PA.

NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

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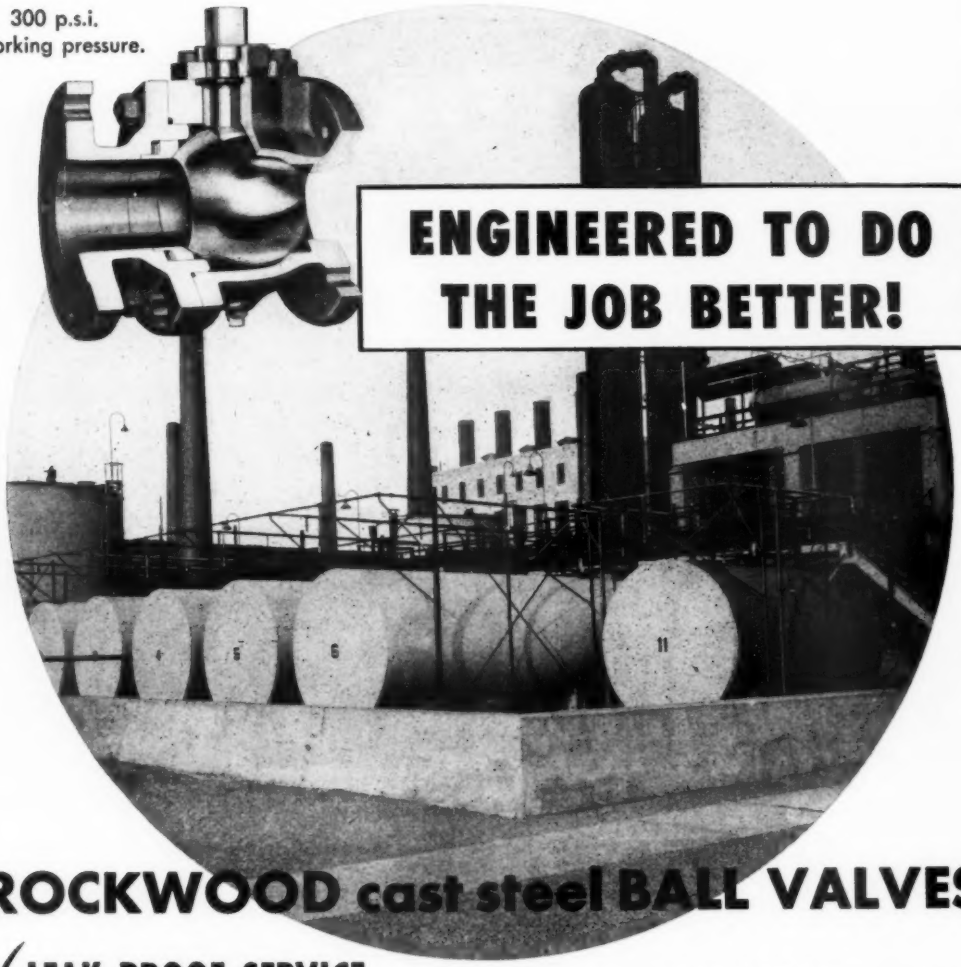
Industrial Gears and Speed Reducers
LimiTorque Valve Controls

300 p.s.i.
working pressure.



ENGINEERED TO DO THE JOB BETTER!

ROCKWOOD cast steel BALL VALVES

✓ LEAK PROOF SERVICE

✓ FULL ROUND FLOW

✓ QUICK OPENING and CLOSING

✓ NO MAINTENANCE

These remarkable Rockwood Cast-Steel Ball Valves are engineered to withstand rugged service in refineries, chemical, food, paper, textile and other processing plants. They are more dependable and will operate perfectly over and over again with no maintenance. Full *round* flow area allows fluids to pass thru valve without creating turbulence — friction loss is reduced to a minimum. Resilient synthetic rubber seat against hard chromium plated floating ball forms a tight seal — stays tight! Quarter turn quickly and easily opens and closes valve under pressure. Valves can be installed in any position.

Remember, Rockwood Cast-Steel Ball Valves are Engineered for dependability — designed and built for longer trouble-free service. Call your nearest distributor or write direct to Rockwood Sprinkler Company for complete information and prices. Rockwood Valves are available in Cast-Steel in 3" & 4" pipe sizes — in bronze ½" to 2" pipe sizes.

Approved by Underwriters' Laboratories Inc.

Distributors in all principal cities.

ROCKWOOD

ROCKWOOD
SPRINKLER COMPANY
104 HARLOW STREET
WORCESTER 5, MASS.

Thermoid
Industrial Rubber Products
Quality Value Service

Multi-V Belts For Tough Oil Field Service

Here's a cost-cutting combination! Thermoid Multi-V Belts . . . Rotary Hose . . . Mud-Flow Suction Hose . . . Flexible Discharge Units.

The going is tough for any equipment in oil field service. But not too tough for Thermoid Multi-V Belts!

Thermoid Multi-V Belts are pre-stretched to insure maximum power transmission without adjustment. They are constructed for flexibility and for ability to absorb repeated shocks—thoroughly impregnated with special rubber compounds to withstand moisture and abrasion. The result is longer belt life.

Thermoid Multi-V Belts are available in matched sets... uniform in size and cross section. Their longer life and non-slip performance add up to the lowest possible cost in any service.

Thermoid Multi-V Belts reflect the same care in manufacturing... the same constant research aimed at product improvement ... that have made Thermoid Products the standard of performance in the oil fields.

Mid-continent Office and Warehouse: Houston, Texas

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Thermoid

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Wire Line Turn Racks • No-Wip Line Savers • Stuffing Box Rings • All Types of Hose • Molded Specialties • Brake Blocks

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WE DO THE *spadework..*

THE thorough-going procedures of the field crews, the competency of the party chiefs, and the extensive professional experience of *every* key member of the Independent organization is the foundation on which a long list of oil producers have been building successful geophysical exploration programs for 18 years. The success of your own quest for new oil reserves depends on how well the spadework is done. It will pay you to consult with Independent about your next survey project.

N. N. Zirbel graduated from Rice Institute and started to work with Independent 18 years ago. He went through the mill learning thoroughly the function of every man on a survey party before becoming a party chief. Only men with such extensive training and field background hold posts of responsibility with Independent.

POINTING THE WAY IXC FOR THE DRILL

Independent *Geophysical Surveys*

EXPLORATION COMPANY

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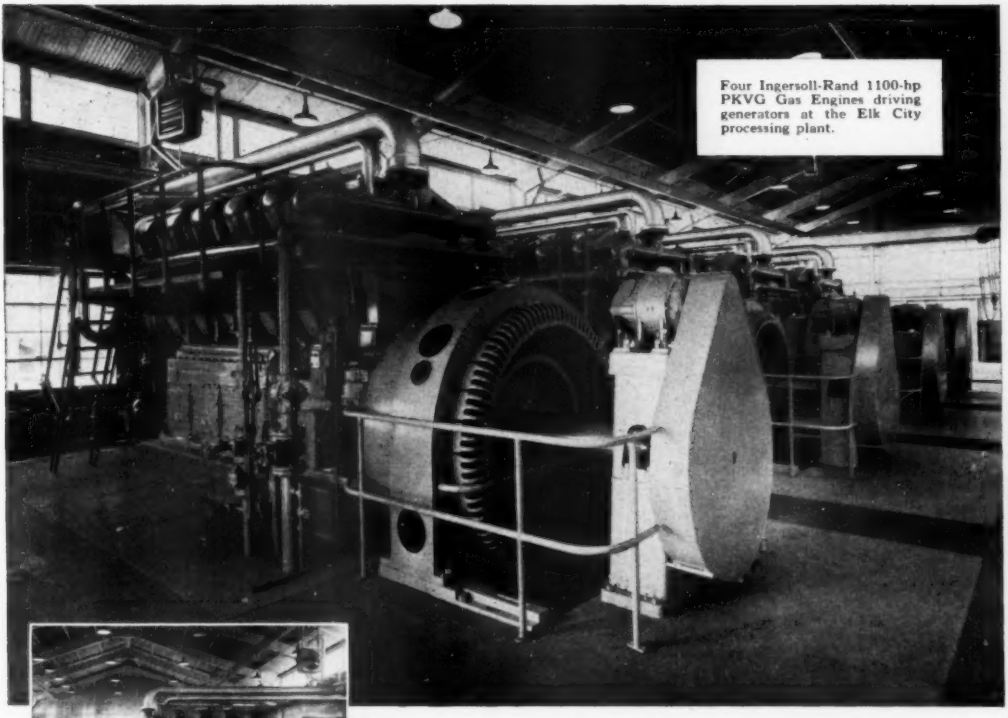
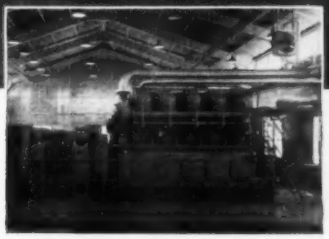


Four Ingersoll-Rand 1100-hp PKVG Gas Engines driving generators at the Elk City processing plant.



ELK CITY
PROCESSING AND GAS CYCLING PLANT
Generates their Power with PKVG Gas Engines

Birth of an Oilfield

In 1946, Elk City was a sprawling agricultural community in western Oklahoma—typical of the kind of city that forms the backbone of this country. Oil geologists had probed the red soil of the rolling hill country around Elk City for many years. After starting oil drilling operations in September '46, it took 15 discouraging months of "nightmare" drilling and a $750,000 expenditure before success was achieved.

Today, with an investment totaling more than 32 million dollars, the Elk City oil and gas field processing unit is producing 15,000 barrels of crude oil daily, 225,000 gallons of natural gasoline and butane, and 55,000 gallons of propane.

All of the electric power at the Elk City Processing Plant is generated by four large PKVG units. Each engine develops 1080 bhp at 1960 feet altitude.

The PKVG is a modern V-type, heavy-duty gas engine—compact, accessible, and easy to install and operate. Its multi-cylinder, 4-cycle design assures smooth operation, reliability, and flexibility.

The low-cost maintenance and high operating economy of Ingersoll-Rand PKVG Gas Engines have become a tradition in the oil and gas industry. It took years of experience to build up this reputation—and all of this experience is at your disposal. Just call your nearest I-R representative.

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Gas-Engine-Driven Compressors: from 110 to 1320 hp

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for high speed drilling in all

for softer formations — for drilling in softer shales and unconsolidated formations, CP TYPE ES-5B ROCK BIT has teeth widely spaced for minimum contact on bottom, and deeper penetration.

The diameters and angle of taper on cones produce a combined rolling and sliding action that gives maximum drilling speed in the softer formations. Also suited for tough, sticky shales, and areas where light weight must be used to maintain a straight hole.

OTHER OIL WELL DRILLING TOOLS INCLUDE REAMING BITS, GUIDE REAMERS, TOOL JOINTS, DRILL COLLARS, ROTARY SUBS AND JUNK BASKETS.

for soft to medium formations — CP TYPE ES-5 ROCK BIT, of the same general design as the ES-5B, has more teeth, less widely spaced. It is an all-purpose bit, suitable in very soft formations and also in harder shales, anhydrite, softer lime and broken formations. Heavy weights may be used with safety when necessary.

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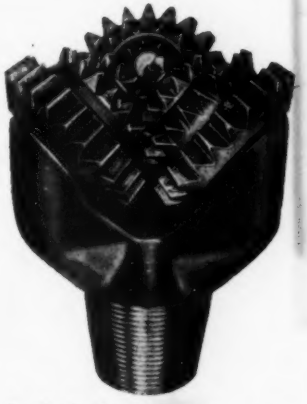
a line of high alloy steel
Three Cone Rock Bits that
assure the most effective drilling
at maximum speed and footage
for every kind of formation
— soft, medium or hard.
A stock of popular sizes is available
at convenient locations.

formations

for medium formations — CP TYPE EM-4 ROCK BIT is designed for drilling in hard sands, hard shales, anhydrite, and medium-hard limestones, that are too hard or abrasive for the ES-5.

for medium to hard formations — built with strong teeth to withstand the heavy weights required in drilling rocks of high compressive strength, CP TYPE EM ROCK BIT is a general purpose bit of unsurpassed efficiency in hard limestones, dolomite, hard shales and anhydrite.



for the hardest formations — in exceedingly hard or abrasive material, including chert, quartzite and granite, the CP TYPE EH ROCK BIT is designed so the teeth exert a rolling, crushing action with a minimum of sliding. It can be used with extremely heavy weights without sacrifice of drilling speed.

WRITE FOR COPY OF BULLETIN 1001

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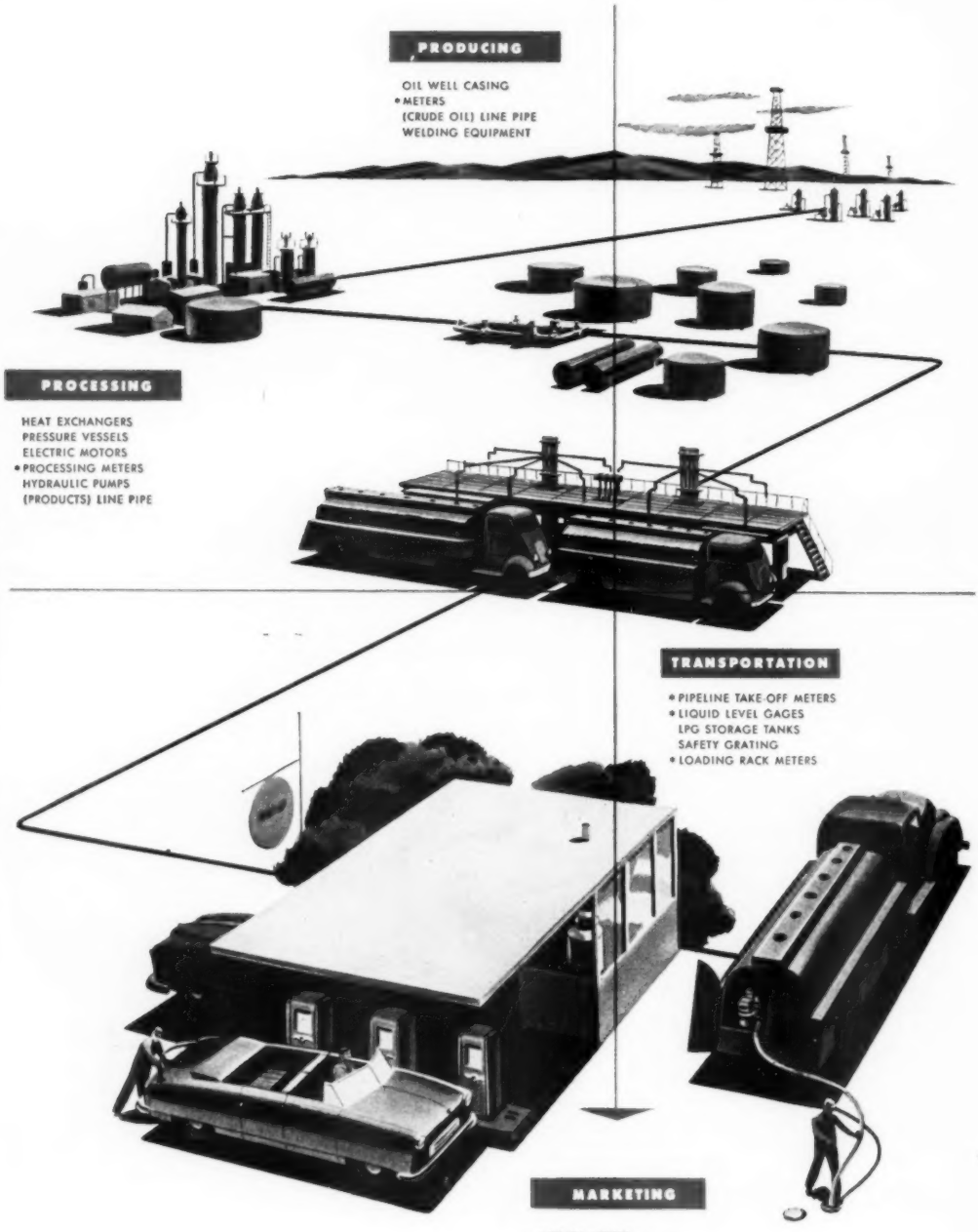

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THE 16D-5 ...BETHLEHEM'S STURDY LITTLE PUMPING UNIT FOR SHALLOW-WELL PRODUCTION

Meet Bethlehem's newest addition to its long and famous line of pumping units. Name? The 16D-5.

This is a little fellow. Smallest unit we make. But it's cut out for a big job in its own class—meaning shallow-well production.

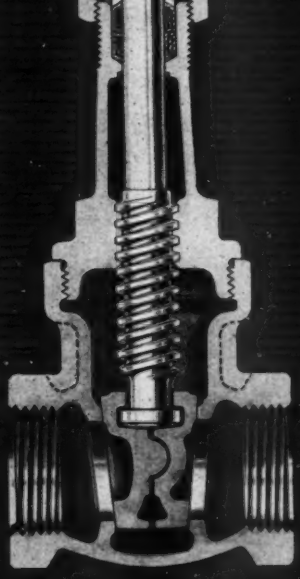
The 16D-5 is a beam-balance unit with 16,000-in.-lb torque capacity and a load rating of 5150 lb at the polished rod. Strokes, 16, 18½, and 22 in. Prime mover as specified—electric motor with or without time-clock controller; gas or gasoline engine.

Like to know more? For full details and specifications, call Bethlehem Supply—the office or store nearest you.

BETHLEHEM SUPPLY COMPANY

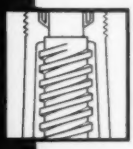
General Offices: 21 E. Second St., Tulsa, Okla.
West Coast Headquarters: Los Angeles, Calif.
Export Distributor: Bethlehem Steel Export Corporation

ARE YOU GETTING THESE ADVANTAGES FROM YOUR BRONZE VALVES?



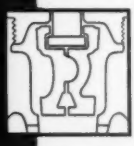
STEMALLOY

This amazing silicon bronze alloy, an exclusive Lunkenheimer development, eliminates stem-thread failure, has actually been tested at 300,000 openings and closings!



REPACKING SEATS

You can repack while the valve is wide open and under pressure. Perfectly machined backseating surfaces are located above stem threads where scale does not collect.

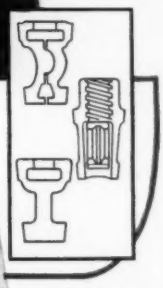


STAY-ON DISCS

Double-wedge disc sections are pressed against bonnet when valve is fully opened, won't fall out when bonnet assembly is removed.

HEXAGON HEAD GLAND

Six faces are provided for secure wrench grip to loosen and raise gland. No more troublesome prying, as with old-fashioned round type.

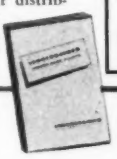


INTERCHANGEABILITY

Choose a rising or non-rising stem; double-wedge, solid wedge, or single-wedge disc. Switch trim for any service, and provide new parts as you need them. With these valves in stock, you keep inventories low —yet never have shortages.

WRITE FOR

"Lunkenheimer Copper Base Alloys," a useful book which explains valve metals, helps you choose the *right* valves for specific jobs. Ask your distributor, or write The Lunkenheimer Co., Box 360F, Cincinnati 14, Ohio.



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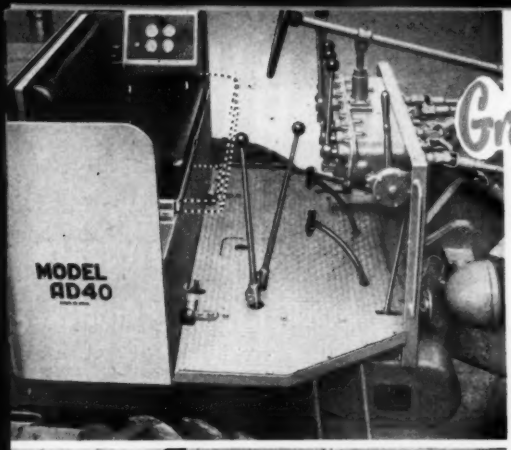
NOW! a Great New HEAVY-DUTY GRADER

Allis-Chalmers AD-40

Weight—23,000 lb.
(24,800 lb. with optional calcium chloride in tires)

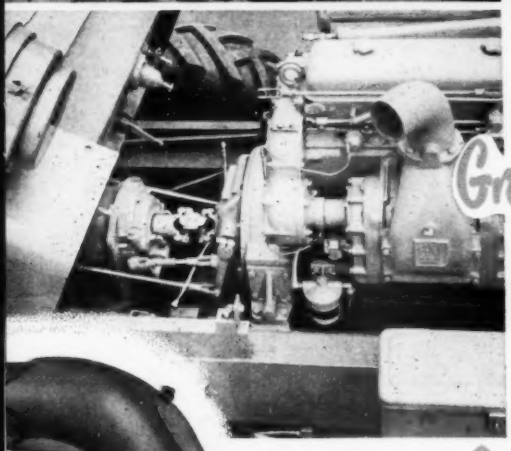
104 Brake hp.

Built to handle All Jobs —FASTER, EASIER



Great New operating ease

No other grader has been designed with the operator more in mind. **Unmatched Visibility**—Single tubular frame from front to platform, new lift cases, low control box and tapered platform give operator a full view of what he is doing. **Feather-Touch Steering** — New hydraulic booster system, fully enclosed in the frame, provides effortless steering with positive control even under toughest conditions. **All-Around Comfort**—Roomy platform, adjustable seat (as shown) and simple controls offer any size operator true comfort—sitting or standing.



Great New service simplicity

Here's maintenance and repair accessibility second to none. Combined fuel tank and seat unit tilts forward for easy access to clutch, transmission and drive shaft. Transmission can be removed without disturbing floor plates. Power take-off and hydraulic pump are mounted outside the dash.

Great New performance

Add these outstanding operator and service advantages to the exclusive Allis-Chalmers features that include ROLL-AWAY* Moldboard — extra high clearances from front to rear — shock-absorbing tubular frame—dependable General Motors 2-Cycle diesel power . . . and you have the finest heavy-duty grader on the market. Get the full story on this new AD-40 from your Allis-Chalmers dealer now.

*ROLL-AWAY is an Allis-Chalmers Trademark.

ALLIS-CHALMERS

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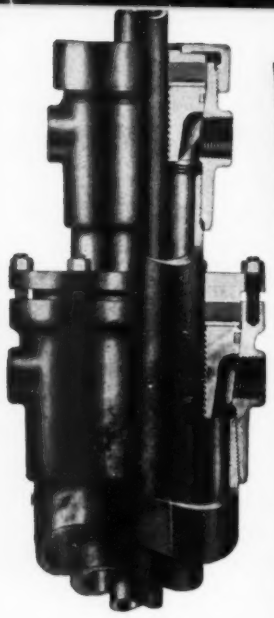


Type R Forged Steel
Casing and Tubing Heads

RECTOR REDHEAD

gives you widest variety of low-pressure casing and tubing head arrangements.

Designed and manufactured by the industry's leading producer of high pressure heads, the RECTOR REDHEAD has innumerable features that put it far ahead in the field of low cost, low pressure, forged steel casing and tubing heads.

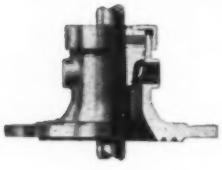
Ruggedly constructed, the bodies have greater thickness and strength than the casing or tubing to which they will be attached. Case hardened slips are flush segment type with raised construction to permit full flow to the bottom. A pipe recovery back-off rests on a split junk ring directly on the slips. On the double heads this packing is secured by a split gland bolted to the head body. On the single tubing head it is secured by a gland tightened down by a screw cap on top of the head.

A slip seal adapter is available to carry slips, packing and gland to fit a stripper can be carried in the tubing head body. Stripper and slips are interchangeable in bowl and head body so that two strippers can be used.

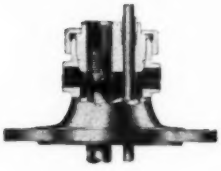
Type R Casing and Tubing Heads are available with flanged or threaded bottom connection. Male threaded and flanged drilling adapters are available for screwing on top of the Tubing Head. A special threaded mandrel is available when head is used with Kobe Pump.

Ask your nearest Rector Representative, authorized Supply Store, or write for complete details about the Rector Redhead.

● Threaded bottom Type R Tubing Head with slips and stripper. For workover jobs a second stripper can be used in place of the slips in the adapter bowl. Slips and stripper are interchangeable in head and bowl.



● The Type R Tubing Head with light flange for use on low pressure well having a flanged casing head . . . or to replace high pressure tubing head and tree when changing from flowing to pumping conditions.



● The original tubing head installation can be adapted to the Kobe Pump simply by using the special threaded mandrel with stuffing box for the power lines. The mandrel, resting on a ground joint seat, has an "O" ring seal.

● Type "R" Casing Head with threaded bottom. Notice how ribbed construction of slips permits full flow to side outlets, also simplicity and effectiveness of sealing arrangement.

RECTOR WELL EQUIPMENT COMPANY INC

★ MAKING THE OIL INDUSTRY SAFER ★

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has PROVED these advantages of

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INCREASES DRILLING RATES... Improved lubricating properties and fluidity increase drilling rate from 13% to well over 100%.

REDUCES DRILL PIPE TORQUE from 15% to 40%.

RESISTS CONTAMINATION, particularly when maintained at high pH.

LOW FILTER LOSS. 1ccAPI, or even less, if required.

PROTECTS PRODUCTIVE ZONES against filtrate invasion.

RESISTS HIGH TEMPERATURES AND HIGH PRESSURES.

FLEXIBLE—STABLE—EASILY MAINTAINED... Baroid Emulsion Muds can be compounded to meet practically every drilling condition, and control and maintenance are simple.

These advantages of Baroid Emulsion Muds have been proved in actual drilling in Louisiana, in the Texas Gulf Coast, in the Midcontinent areas, in the Permian Basin, in California, in Illinois and in the Rockies... successfully meeting every type of drilling problem and making drilling easier, safer and faster. Write for complete details.

Complete Drilling Mud Service

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YOU DERIVE THE FOLLOWING ADVANTAGES:

1. ACCELERATED FABRICATION—
with ThredOlets no coupling preparation is necessary—you obtain the most economical type of construction.

2. NEAT AND UNIFORM APPEARANCE—
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ThredOlets provide a funnelled inlet—you achieve better performance and better piping system design.

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with each ThredOlet installation, you have constant control of the critical center-of-run-pipe to face-of-outlet dimension.

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Setting a record is no easy job, but it's well worth the effort—especially when safety is involved.

We are proud of the part we have played in the oil industry's safety record. We are particularly proud that the system of safety precautions for the handling and mixing of "Ethyl" antiknock compound and the safe practices in tank-cleaning techniques which have been accepted and put into effect throughout the industry were pioneered by Ethyl safety engineers.

However, Ethyl safety engineers do a lot more than prevent accidents. They save refiners time and money, too. For example, they are constantly seeking new ways to save time and labor and to assure safe operation. This search has resulted in many improvements in mixing installations, tank-cleaning methods

(*Continued on next page*)

ETHYL
ETHYL CORPORATION

A safety record is no accident

(*Continued from preceding page*)

and has contributed to improvements in storage-tank design. One recent contribution is the "Ethyl" lead-in-air analyzer which quickly checks the amount of lead in the air at any moment—permitting the safe entry of tank-cleaning personnel.

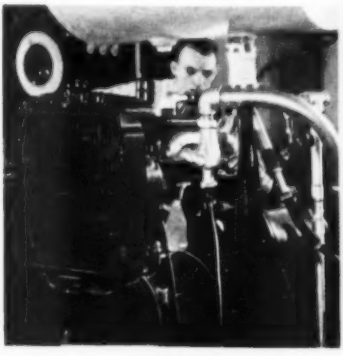
Our engineers have broad experience in the construction, operation and maintenance of mixing plants. You can put this experience to work for you if you are contemplating the erection of new mixing installations or modernizing existing plants. Our trained men will assist you in the selection of a site, supply plans and specifications, and instruct refinery personnel in correct procedures for operating the new equipment. And when your plant is in operation, Ethyl's engineers help keep it working at top efficiency. They make periodic "check up" visits, assist with maintenance and help make modifications to meet changing conditions.

So you can see why we say "A safety record is no accident."

ETHYL CORPORATION

NEW YORK 17, N. Y.

Ethyl service is backed by 28 years of antiknock experience



RESEARCH

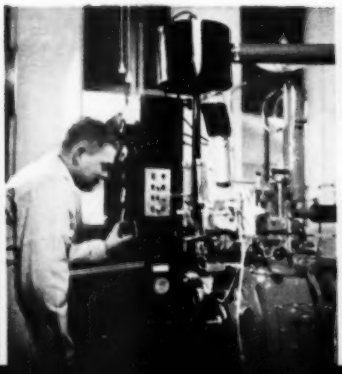
PREMIUM-GASOLINE PROMOTION

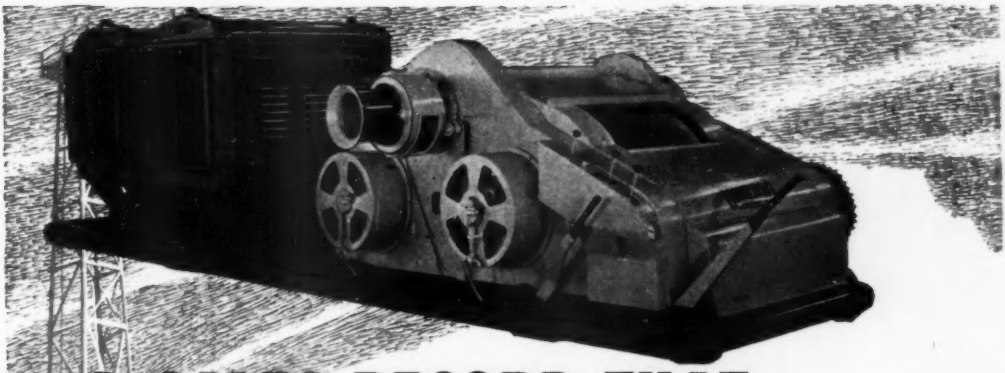
SUPPLY SERVICE

GASOLINE TESTING

TECHNICAL NOTES

ROAD RATINGS INDOORS





A SALES RECORD THAT PROVES ACCEPTANCE

Since the U-34 was introduced in April, 1948, over seventy of these models have been put into operation. Approximately 30% of the units sold were reorders by satisfied users. Where can you find an acceptance record as good as this for a brand new drawworks?

SPECIAL FEATURES OF THE U-34 AND U-34D

VERSATILITY — Single or double-drum models. One or two engines. One package unit or split-rig unit make for many combinations to suit your individual needs.

SPEED — Fast operating combination because each engine is equipped with a torque converter which allows each engine to reach high speeds QUICKLY where maximum Horse Power is attained.

SAFETY and SIMPLICITY — All controls designed for the convenience of the operator. Self-energizing, fully equalizing, one point adjustable brakes. Self-cooling Air-O-Matic clutch requires no adjustment. One-lever control for all drum speeds. Unique design of control and drum clutches practically eliminates clutch failure.*

PORTABILITY — Designed so drawworks and power unit may be transported in one load, thus reducing moving costs and time.

*One set of clutches shows slight wear after 90,000' of drilling. To March, 1951 only one clutch failure traced to low air pressure.

UNITRIG & EQUIPMENT CO.
TULSA, OKLAHOMA U.S.A.

DESIGNED FOR THE JOB....

UR-514

UNIT RIG DRAWWORKS ARE SOLD EXCLUSIVELY THROUGH THESE AUTHORIZED DISTRIBUTORS IN THE USA AND CANADA

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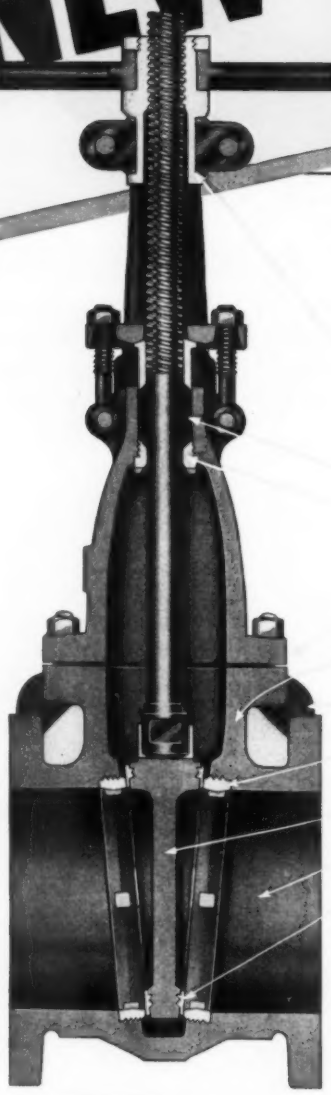
IRON VALVES that give you Steel Valve Features

OIC
FOUNDED 1883



NOW the workhorse of the family—OIC's iron valve—offers you features formerly found only in steel valves. It's a brand new valve built around more than a third of a century's experience in making iron valves. We kept only the old handwheel.

Examine these construction details:

1. Lubricated yoke bushing, renewable without removing bonnet.
2. Deeper stuffing box; longer packing life.
3. Inserted back seat bushing permits repacking under full pressure.
4. Stronger body-bonnet joint; uniform gasket compression.
5. Better metal distribution, reduced weight, increased strength.
6. Sturdy tie-ribs; added resistance to pipeline stresses.
7. End-seated bronze seat rings will not loosen in service.
8. I-Beam type solid wedge, accurately guided.
9. Straight-through port areas reduce flow resistance.
10. Rolled-in seat facings on wedges give longer life.

OIC's new line of Iron Valves gives you longer service, lower upkeep and greater security. For Bulletin 805 telling you all about them, call your local OIC distributor or write The Ohio Injector Company, Wadsworth, Ohio.

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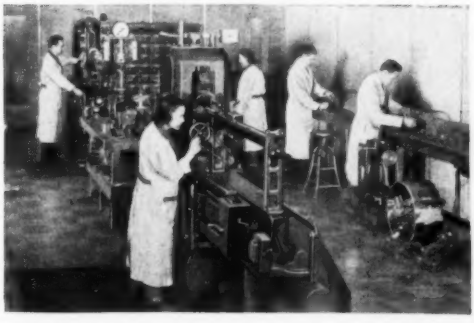
WELDING LABORATORY—Center of research covering electrodes, procedures, processes, and equipment. Special equipment is available to determine the best procedures for shop and field welding. Extensive tests are made to adapt new procedures to automatic, as well as manual application.

METALLURGICAL LABORATORY—Heat treating section where investigations are run to determine proper heat treating procedures. Other sections are available for metallographic examination, hardness and accelerated corrosion testing.

SPECTROGRAPHIC and X-ray diffraction equipment is used for exacting analysis of materials and manufacturing processes. They are also used in special investigations relating to heat exchanger research projects.

A. O. Smith Heat Exchangers

for every service!



PHYSICAL LABORATORY—This laboratory has complete facilities for performing tests necessary to determine exact physical properties of all steels and alloys used in heat exchanger manufacture.

Your heat exchanger problems are solved at A. O. Smith by top-flight engineers and technicians in metallurgical and welding research and by specialists in heat exchanger design.

The quality of the materials selected is maintained by meticulous control procedures in our spectrographic and physical testing laboratories.

Heat exchangers are made and assembled under strict shop quality control, using the most modern machine tools and other mechanical equipment. A. O. Smith has the experience and equipment to perform any necessary test before the finished exchanger is shipped.

There is no limitation on A. O. Smith heat exchanger sizes, temperature or pressure ranges except those imposed by the properties of the materials used.

INDUSTRY COMES TO A.O.SMITH WITH HEAT EXCHANGER PROBLEMS

Research and Engineering Building

78th ANNIVERSARY 1874 1952

A.O.Smith

VESSELS • HEAT EXCHANGERS

Boston 16 • Chicago 4 • Cleveland 15 • Dallas 2 • Denver 2
Houston 2 • Los Angeles 22 • Midland 5, Texas • New Orleans
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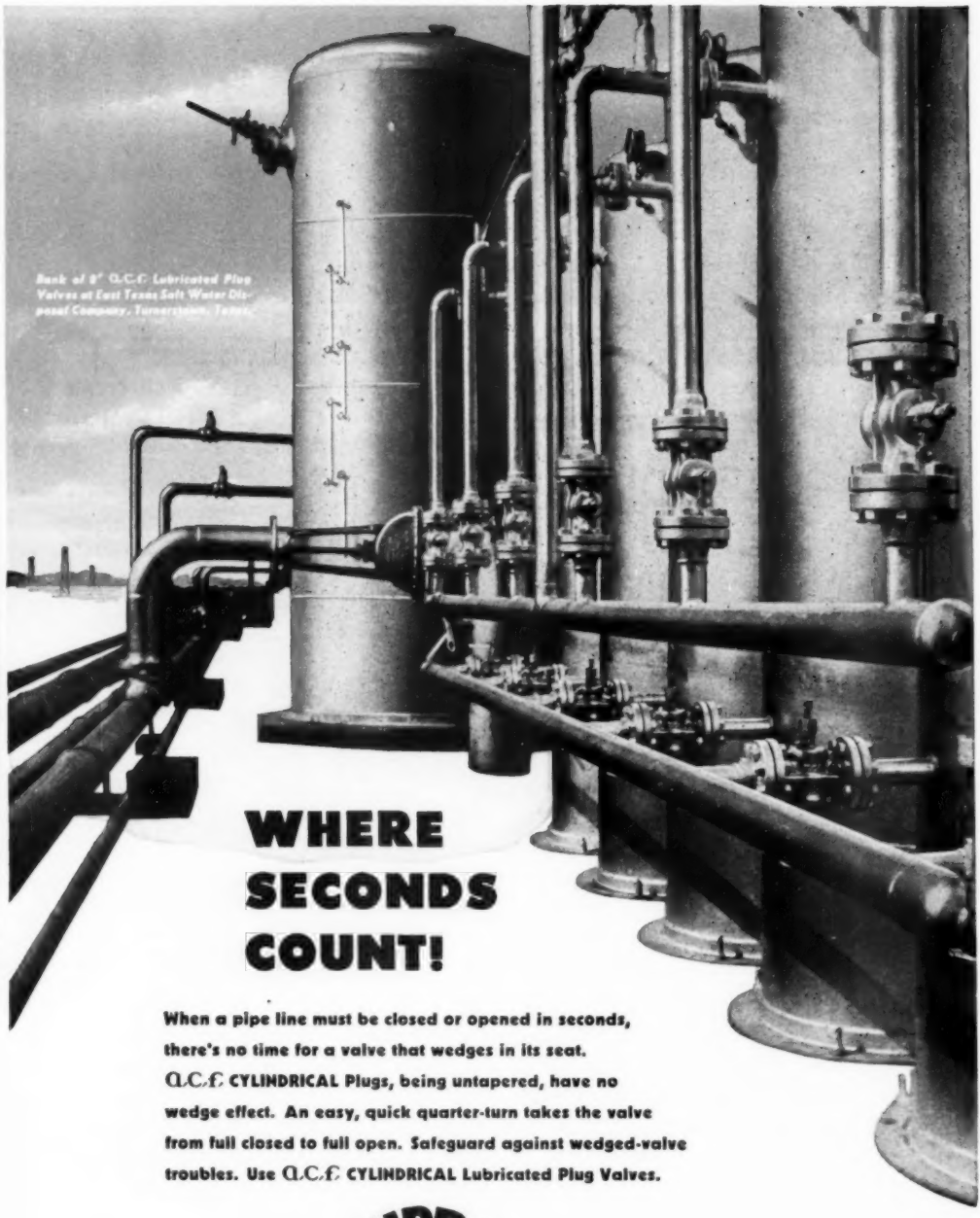
San Francisco 4 • Seattle 1 • Tulsa 3 • Washington 6, D.C.
International Division: P.O. Box 2023, Milwaukee 1



Bank of 8" A.C.F. Lubricated Plug Valves at East Texas Salt Water Disposal Company, Turnerville, Texas.

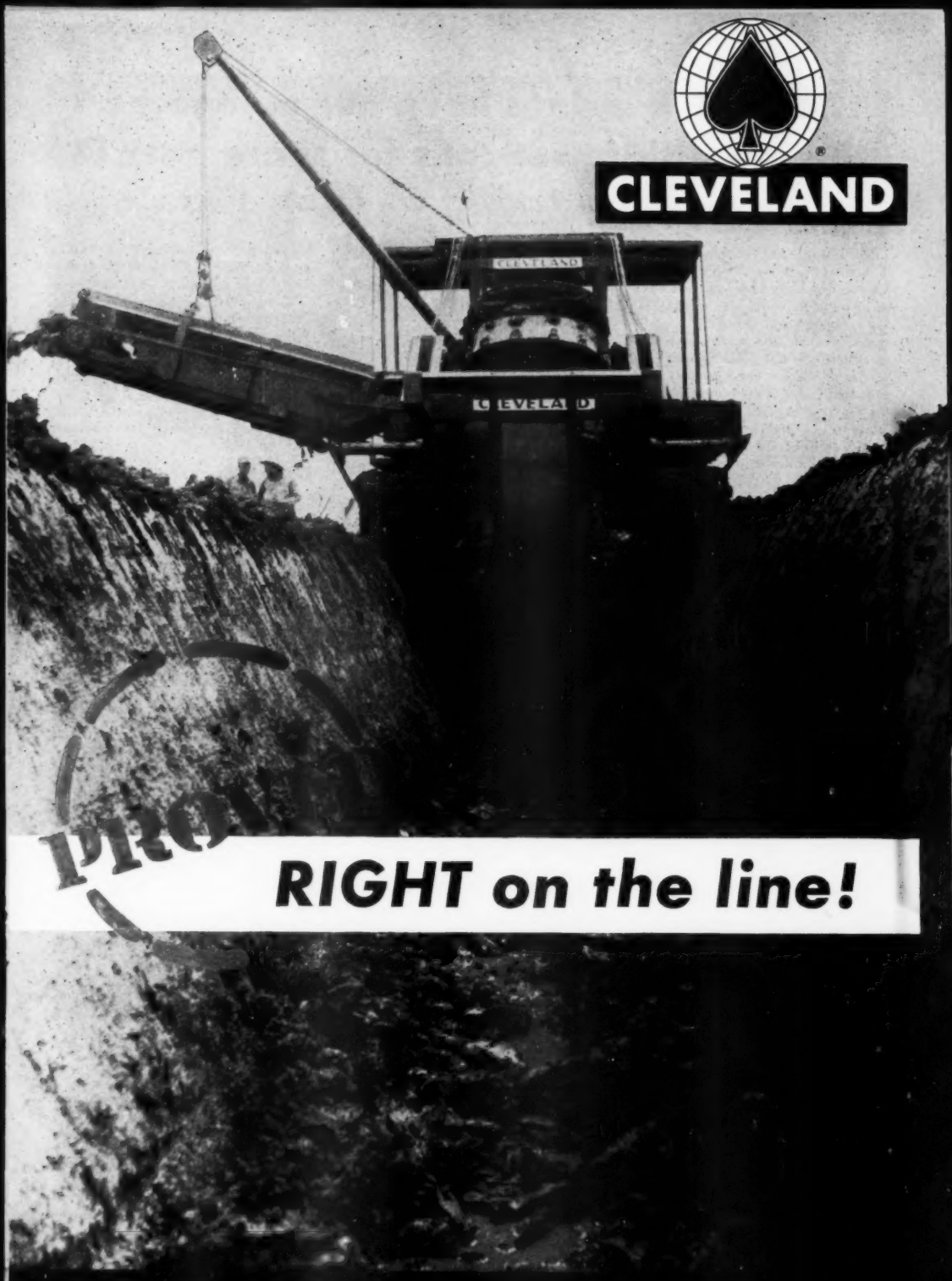
WHERE SECONDS COUNT!

When a pipe line must be closed or opened in seconds, there's no time for a valve that wedges in its seat. a.c.f. CYLINDRICAL Plugs, being untapered, have no wedge effect. An easy, quick quarter-turn takes the valve from full closed to full open. Safeguard against wedged-valve troubles. Use a.c.f. CYLINDRICAL Lubricated Plug Valves.

a.c.f. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

Representatives in 50 Principal Cities

Ask for Catalog 4-OG, American Car and Foundry Company, Valve Division, 1501 East Ferry Avenue, Detroit 11, Michigan


CLEVELAND
RIGHT on the line!
THE CLEVELAND TRENCHER CO.
20100 ST. CLAIR AVENUE
CLEVELAND 17, OHIO

"TIMKEN® bearings keep our pumpers on the job with fewer calls for spare parts!"

. . . says Alten Foundry & Machine Works

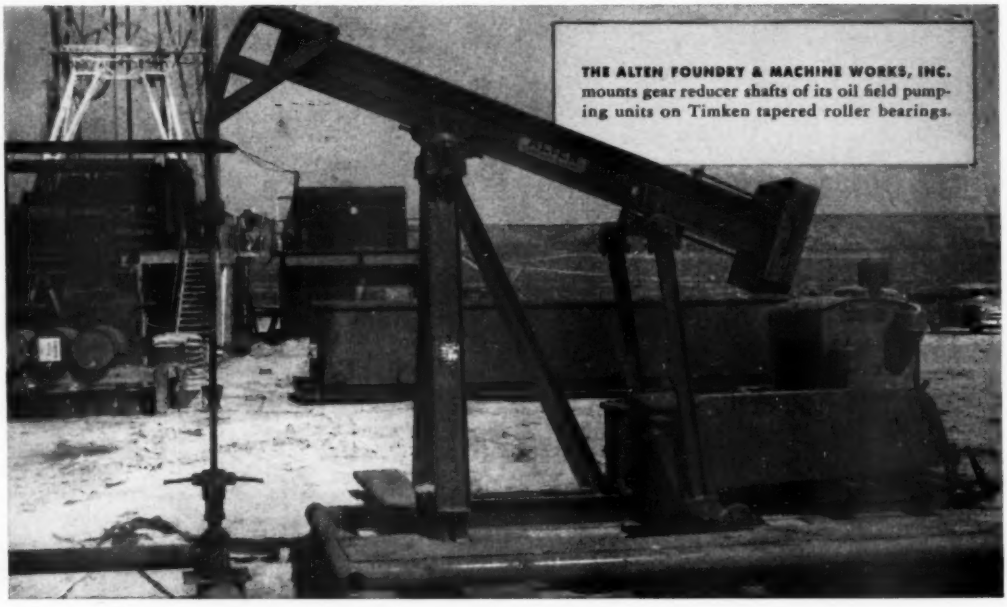
ALTEN oil field pumping units are often used in remote locations like deserts and swamps, where operating conditions are far from ideal. To keep its units on the job under these conditions—with a minimum of attention—The Alten Foundry and Machine Works, Inc., mounts gear reducer shafts of its pumping units on Timken® tapered roller bearings. Timken bearings assure dependable pumping, reduce wear, cut spare parts requirements to a minimum.

The tapered construction of Timken bearings enables them to take radial and thrust loads or any combination. Line contact between the rollers and races of Timken bearings provides extra load-carrying capacity. As a result, Timken bearings hold shafts in proper alignment. Gears mesh with accuracy, minimizing wear on moving parts.

Timken bearings make closures more effective because they keep housing and shaft concentric. Lubricant is kept in—dirt and moisture kept out. Because of true rolling motion and incredibly smooth surface finish, Timken bearings practically eliminate friction—and wear in the bearing.

Timken bearings add extra value to any product in which they're used. When you buy new equipment, be sure it's Timken bearing equipped. And when you buy bearings, be sure they carry the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



THE ALTEN FOUNDRY & MACHINE WORKS, INC. mounts gear reducer shafts of its oil field pumping units on Timken tapered roller bearings.

DESIGN LEADERSHIP

The first Timken tapered roller bearing was produced in 1898. Since then the one-piece multiple perforated cage, wide area contact between roller ends and ribs, and every other important tapered roller bearing improvement have been introduced by The Timken Roller Bearing Company.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

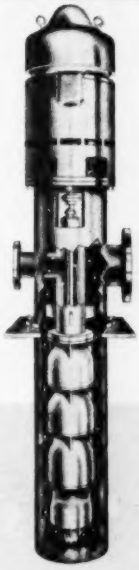
NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION →◎←

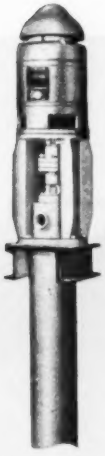
Boiling point temperatures and limited NPSH pose no problem for these VMT pumps!

WHEN PUMPING FLUIDS at boiling point temperatures, the problem of sufficient net positive suction head often requires expensive installation to raise the vessel from which the pump would draw or to excavate a pit to lower the pump.

This is eliminated with the BJ "VMT" pump because the vertical multi-stage pumping unit is mounted in a barrel from which it takes a suction. The base of the pump is at ground level while the length of the barrel is determined by the NPSH requirement.

The "VMT" pumps (shown above) serving as boosters from gasoline tank farm to main line stations are just one of the many successful applications for refineries, pipe lines, fueling stations, power plants, and process industries. For more detailed information on how the "VMT" may solve your pumping problem, call your local BJ sales office or send the coupon below.





FILE FACTS:

- Capacities to 5000 gpm. Heads to 250 psi. Temperatures from sub-zero to 750° F.
- Handles corrosive or non-corrosive liquids
- Radial forces balanced at all speeds
- Adjustable coupling for easy, accurate impeller setting

Also available in the smaller "VLT" model (capacities to 110 gpm). Provides the same basic construction and installation advantages as the "VMT," yet is priced for general purpose application.

Byron Jackson Co.

Since 1872

P. O. Box 2017, Terminal Annex, Los Angeles 54, Calif.

OFFICES IN PRINCIPAL CITIES

BJ Pump Division, Dept. 26
Please send me Bulletin No. 51-6600 on your VMT pump.

NAME_____

FIRM_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

WILSON SUPPLY
INGERSOLL-RAND

"Packaged" Portable

COMPRESSORS

are giving

OUTSTANDING

CONTINUOUS PERFORMANCE

in

THE FIELD

from

NEW MEXICO

to

MISSISSIPPI

from

SOUTH TEXAS

to

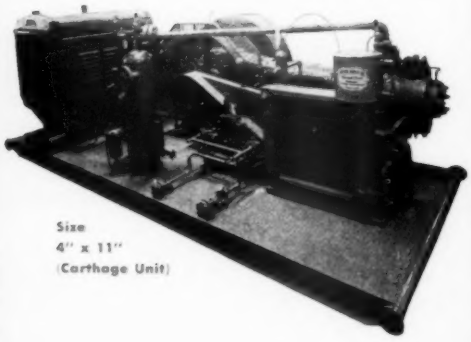
OKLAHOMA

ANTICIPATE NOW.....

In Gas-Oil Lift, Repressuring and Booster work Wilson Supply — Ingersoll - Rand "Packaged" Portable Compressors have won wide acceptance from the Producing Industry.

These "Packaged," Portable Compressors are built, assembled and mounted to give long, continuous, trouble-free performance. They do not require the constant attention of a skilled Compressor man. They are equipped with many automatic safety features which protect the equipment in event of mishap when the attendant is not present.

These "Packaged" Portable machines are mounted on heavy skids and take the place of far more costly permanent installations. They can be furnished in the size to best meet your specific requirements.



Size
4" x 11"
(Carthage Unit)

YOUR COMPRESSOR NEEDS FOR 1952

. . and Avoid Delays Caused by Possible Slow Deliveries

The demand for Wilson-Supply–Ingersoll-Rand "Packaged" Portable Compressors is increasing every month. This, added to the critical material supply, has created a situation that often tends to unavoidable delays in delivery.

Operators who are able to anticipate their Compressor needs several months in advance and place their orders NOW, will avoid those delays and have their Compressors on hand when the need arises.

While Wilson Supply Company carries some sizes of Compressors in stock, varying field conditions and requirements make it impossible to carry *all sizes*. This applies to both Compressor Cylinders and Engines.

Contact your nearest Wilson Supply Company Store or write "Compressor Division," Wilson Supply Company, P. O. Drawer 19, Houston, Texas, for detailed information, and quotations. Please give suction and discharge pressure and volume to be handled.

WILSON SUPPLY COMPANY

BRANCH STORES

Texas—Alice, Corpus Christi, Victoria, Bay City, Columbus, Barbers Hill, Liberty, Beaumont, Kilgore, Monahans. **Louisiana**—Lake Charles, New Iberia, Houma, Harvey, Shreveport.

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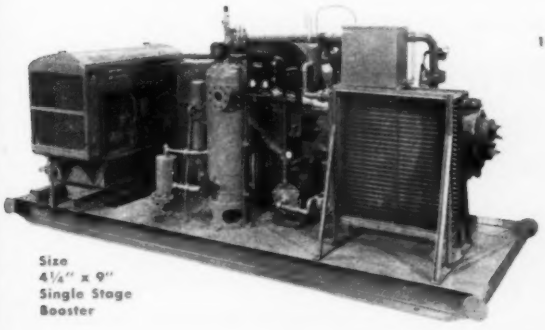
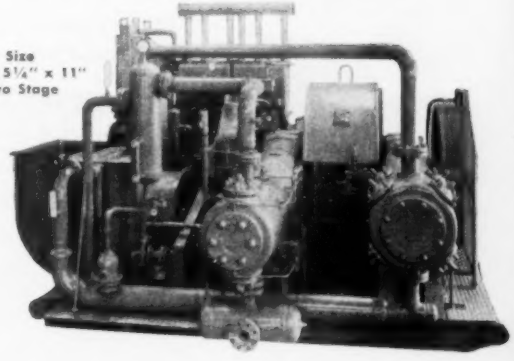


Size
4¼" x 9"
Single Stage
Booster

Size
10" x 5¼" x 11"
Two Stage



Service that assures satisfaction . . . Instrument accuracy that's dependable

WHEN YOU RENT a Sperry-Sun instrument, whether it is a Syfo Clinograph, E-C Inclinometer, Single Shot or Non-Magnetic Drill Collar — or call for a Surwel Multishot Survey — or submit a core for orientation—you get service. We make frequent calls to check each rental instrument to assure you that it is in working order. Business worth getting is worth keeping.

Accuracy and dependability are assured by the exclusive design and precision manufacture of these instruments. If you're not acquainted with these points of superiority, ask the Sperry-Sun representative about them the next time he's around.

For Accuracy and Service *with* Speed, call us.

SURWEL SERVICE • SYFO CLINOGRAPH • E-C INCLINOMETER • SINGLE SHOT • NON-MAGNETIC DRILL COLLAR • TELEFLOODMETER • POLAR CORE ORIENTATION • JOHNSTON ELEVATION METER

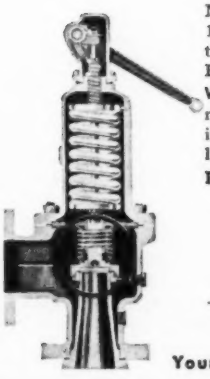
SPERRY-SUN

SPERRY-SUN WELL SURVEYING COMPANY

3118 BLODGETT AVENUE HOUSTON, TEXAS

Philadelphia, Pa. Falfurrias, Odessa, Marshall, Texas Long Beach, Ventura, Bakersfield, Calif.
Oklahoma City, Okla. Lafayette, La. Moulden Oil Field Services, Casper, Wyo. Crossville, Illinois

Stuck without WARNING



Who's stuck? Safety valves that weren't safe? The plant which installed them?

None of this was necessary. If you want 100% safety—and you'd hardly want less—there's one sure way to get it—specify BalanSeal or FarriSeal Valves.

Why? Because they *can't* stick, plug or corrode. Critical working parts are permanently isolated from any contact whatever with the lading.

Because they're unaffected by back pressures in the discharge manifold due to its own operation or to the opening of other valves in the line.

Because these features make it possible for you to use smaller discharge piping, an economy which is often substantially more than the valve cost.

You'll be interested in the engineering of BalanSeal and FarriSeal Valves—design which is rapidly gaining acceptance in hundreds of successful installations.

Ask for our "8-Minute Brief."

Farris ENGINEERING CORP.

412 COMMERCIAL AVE., PALISADES PARK, N. J.

Your Safety's REAL With FarriSeal...

LINDE'S News of Metalworking

Sigma Welding...

A Process with Outstanding Promise

Recently, the country's biggest tank car manufacturer received the largest order for aluminum tank cars ever issued — ninety-eight tank cars on a single order. This order was obtained only because of the development of a fully automatic welding process . . . shielded inert gas metal arc welding — sigma welding.

This welding process has made double-vee butt welds at 5 in. per min. in 1-in. material. Structural welds have been made at 48 in. per min. in ¾ in. plate, and as high as 200 in. per min. on $\frac{1}{16}$ in. material.

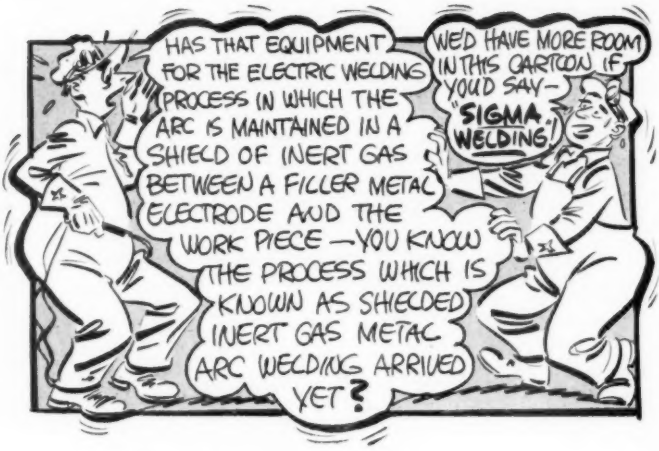
Prior to the development of sigma welding, fabricating aluminum tank cars was a slow hand process. In order to weld the heavy plates used in making the cars, as many as six passes were required.

With an automatic sigma welding setup, X-ray quality welds in the ½ to 1¼ in. thick aluminum plates are made at speeds of from 6 to 15 in. per minute. And only 2 passes, one inside and one outside, are required to get perfect penetration. High current densities used in sigma welding result in narrow welds with deep penetration.

Sigma welding is fast becoming an important fusion welding method. It has not only replaced many other welding methods, but has permitted fabrications hitherto impracticable for welding.

Just recently, a metalworker adopted this process for welding an aluminum-bronze valve seat to a mild steel tube . . . sigma welding proved to be the only practical method he could use for this work.

Another shop built their first *aluminum tank using sigma welding* . . . The large tank was finished so quickly — work progressed without stopping — that the shop will replace all other welding methods with sigma welding. Excellent welds *requiring little finishing* were obtained in the ¾ in. aluminum plates.


HAS THAT EQUIPMENT FOR THE ELECTRIC WELDING PROCESS IN WHICH THE ARC IS MAINTAINED IN A SHIELD OF INERT GAS BETWEEN A FILLER METAL ELECTRODE AND THE WORK PIECE — YOU KNOW THE PROCESS WHICH IS KNOWN AS SHIELDED INERT GAS METAL ARC WELDING ARRIVED YET?
WE'D HAVE MORE ROOM IN THIS CARTOON IF YOU'D SAY — "SIGMA WELDING!"

New Processes Need New Names

The cartoon shows just about the way it started . . . Shielded inert gas metal arc welding was quite a mouthful to say when describing or referring to the process. It also required a lot of space in written material.

Then someone said sigma welding. It was easier to say.

Sigma is a good word, too. Each of the letters is an initial letter of the words: shielded, inert, gas, metal, and arc.

This easy-to-say word, sigma, is now used to describe the process. It is not a trade-marked word, and is used in the same sense as oxy-acetylene welding, gas cutting, or brown dog — just like any other descriptive adjective.

Metals Being Joined by Sigma Welding

Sigma welding can be used on practically all commercial metals. Railroad tank cars, chemical and food processing tanks, pressure vessels, and brewery equipment are only a few applications where the process is being used economically. Here's a quick look at some of the metals being joined by this process:

Aluminum . . . All weldable grades including 3-S, 50-S (150-S), 52-S, 61-S, and the commercially pure 2-S alloy are being welded with excellent results . . . These alloys are being machine welded in thicknesses ranging from 0.50 in. to 1.50 inch . . . Hand welds are made in material ⅛ in. and thicker . . . Maximum thickness that can be welded is unlimited with multi-pass technique . . .

Stainless Steel . . . Sound X-ray quality butt welds have been obtained in thicknesses ranging from ⅛ to ½ inch . . . Quite evident that heavier thicknesses can be welded . . . Results of tests show that welds possess good tensile strength, elongation, and impact resistance . . .

Copper . . . Sound butt, fillet, and corner welds have been made in ⅛ in. and ¼ in. deoxidized copper.

Everdur . . . Butt welds made in ⅛, ¼, and ½ in. thick materials are sound, smooth, and without cracks or undercutting. Tests showed that bend and tensile specimens have excellent properties.

Carbon Steel . . . Sound machine butt welds have been made in ⅛ in., ¼ in., and ½ in. thick killed and semi-killed carbon steels . . .

Aluminum Bronze rod has been deposited on mild steel with excellent results . . . Wear resistance greatly improved . . . Other surfacing and buildup operations very successful . . .

LINDE'S Apparatus for Sigma Welding

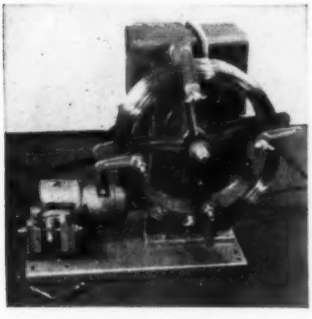
Here is LINDE's sigma apparatus for either machine or hand-welding. It provides automatic operation, accurate and uniform control of rate of rod feed, easy handling, and simplicity of operation . . . Everything to help you make X ray quality welds at high speeds.

Hand Torch Designed for Easy Handling

The LINDE HW-11 Torch is designed for sigma hand-welding. It is lightweight, and pistol-shaped to provide a convenient grip and easy handling. The gas cup and torch power cable are water-cooled for protection from overheating. All hoses to the torch are bound together in a synthetic rubber sheath which is highly flexible.

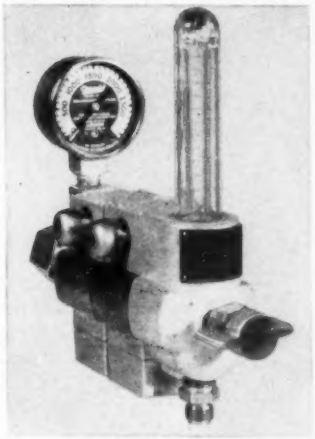
The rated capacity of the torch is 400 amp. when cooling water flow is 1 qt. per min. at inlet temp. of 60 deg. Fahrenheit.

Simple Assembly Controls Rod Feed



LINDE's Rod Feed and Control Assembly for hand-welding, automatically controls rod feed at all times. Rod is fed at a constant predetermined speed which is regulated by an electronic governor. Rate of rod feed depends on the current and material being welded, and can be easily adjusted by a potentiometer. A rough initial setting for the potentiometer is determined from welding data tables. After the arc is struck, the operator can adjust the potentiometer, if necessary, to get a steady, smooth arc. Welding is then done without any further adjustments.

Argon Regulator Assures Uniform Gas Flow

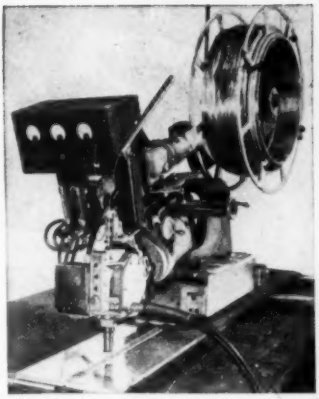


The OXWELD R-502 Regulator, designed specifically for inert gas welding, reduces the pressure of the argon stored in the cylinder to the working pressure needed. One simple setting adjusts it to supply the torch with the correct rate of argon flow required for the work at hand. A built-in flowmeter and throttle valve always show the flow of argon used. The indication is always true, and is not affected by the pressure drop between the valve and the working end of the torch.

Machine Welds Made at High-Speed with the FSM-1

LINDE's FSM-1 machine makes clean, smooth welds. Welding is fast and weld quality high. Almost any metal thickness can be welded by a suitable number of passes.

The FSM-1 is recommended for welding long seams, or for work that is fairly repetitive. The welding head can be positioned for practically any work requirement. It has provisions for vertical and lateral adjustments in two planes for the angle at which the welding rod is fed into the weld zone. Retract starting provides for starting the arc quickly and conveniently.



LINDE Argon (99.92% pure), and Sigma Grade

For welding stainless and carbon steels, LINDE argon — sigma grade, a mixture of oxygen in argon, speeds metal deposition. It permits welding at high speeds without undercutting, improves coalescence of the weld metal, and makes overhead welding of stainless steel practicable.

For those metals requiring a pure argon gas, LINDE offers standard welding argon that is 99.92 per cent pure. This high purity makes it the best all-around shielding gas.

For further information about LINDE's equipment for sigma welding, please contact any LINDE office.

The terms "Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

LINDE AIR PRODUCTS COMPANY
A DIVISION OF UNION CARBIDE AND CARBON CORPORATION
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada:
Dominion Oxygen Company, Limited, Toronto

Bingham

PRECISION BUILT FIELD PROVEN PUMPS

"Double Volute"
DOUBLE CASE, HIGH PRESSURE
Refinery Pumps

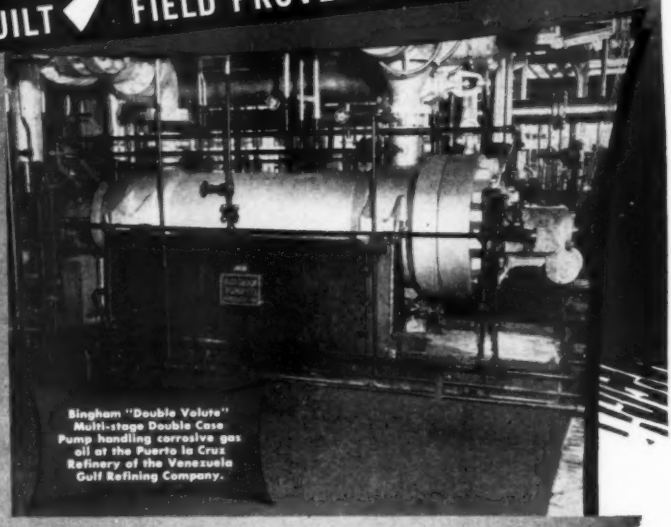
Bingham Double Case Refinery Pumps are of "Double-Volute" design, insuring perfect radial balance of the rotating element — eliminating seizure and wear between rotating and stationary parts and reducing stuffing-box maintenance to a minimum.

A salient feature in Bingham "Double-Volute" pumps is the "TWO NOZZLE" discharge from the inner case into the outer case—the nozzles being located 180° apart. For hot service, this feature provides adequate circulation of pumpage, insuring a uniform temperature rise of all parts, particularly the outer case. *Distortion due to temperature changes is eliminated.*

• • •

It takes Big Precision Tools like these to Build Pumps like this

Bingham Double Case Pumps, like all Bingham products, are precision built. All rotating parts requiring close tolerances are ground on heavy duty precision grinders. Inner volute flanges are finished ground to a perfect degree of flatness by heavy duty grinders which are typical of the precision machinery in our new and modern plant.



Bingham "Double Volute" Multi-stage Double Case Pump handling corrosive gas oil at the Puerto la Cruz Refinery of the Venezuela Gulf Refining Company.

Heavy Duty Face Grinder in our new and modern plant.

SEND NOW FOR "DOUBLE VOLUTE" treatise describing the principle and advantages of Bingham "Double Volute" pumps.

Bingham — DOUBLE VOLUTE — RADIAL BALANCE — PUMPS — SINCE 1921

GENERAL OFFICES:
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Portland, Oregon

FACTORIES:
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Vancouver, Canada

Sales and Service Offices: BOSTON, MASS., 113 Broad Street • CHICAGO, ILL., 275 Old Colony Bldg., 407 South Dearborn Street • HOUSTON, TEX., 1206 Union National Bank Bldg. • MIDDLETON, OHIO, 505 Federal Savings & Loan Bldg. • NEW YORK CITY, N. Y., 611 Graybar Bldg., 420 Lexington Ave. • PITTSBURGH, PENN., 102 Mt. Lebanon Blvd. • SAN FRANCISCO, CALIF., 420 Market St. • SEATTLE, WASH., 316 Joseph Vance Bldg., 1402 Third Ave. • ST. LOUIS, MO., 2533 Salem • ST. PAUL, MINN., 205 South Robert St. • TULSA, OKLA., 200-206 N. Denver St. • VANCOUVER, CANADA, 3550 E. Broadway.

WHERE'S THE FIRE?

There are danger spots in every building (yours, too!) where fire is most likely to strike. These spots can be guarded day and night by a Kidde Automatic Fire Extinguishing System.

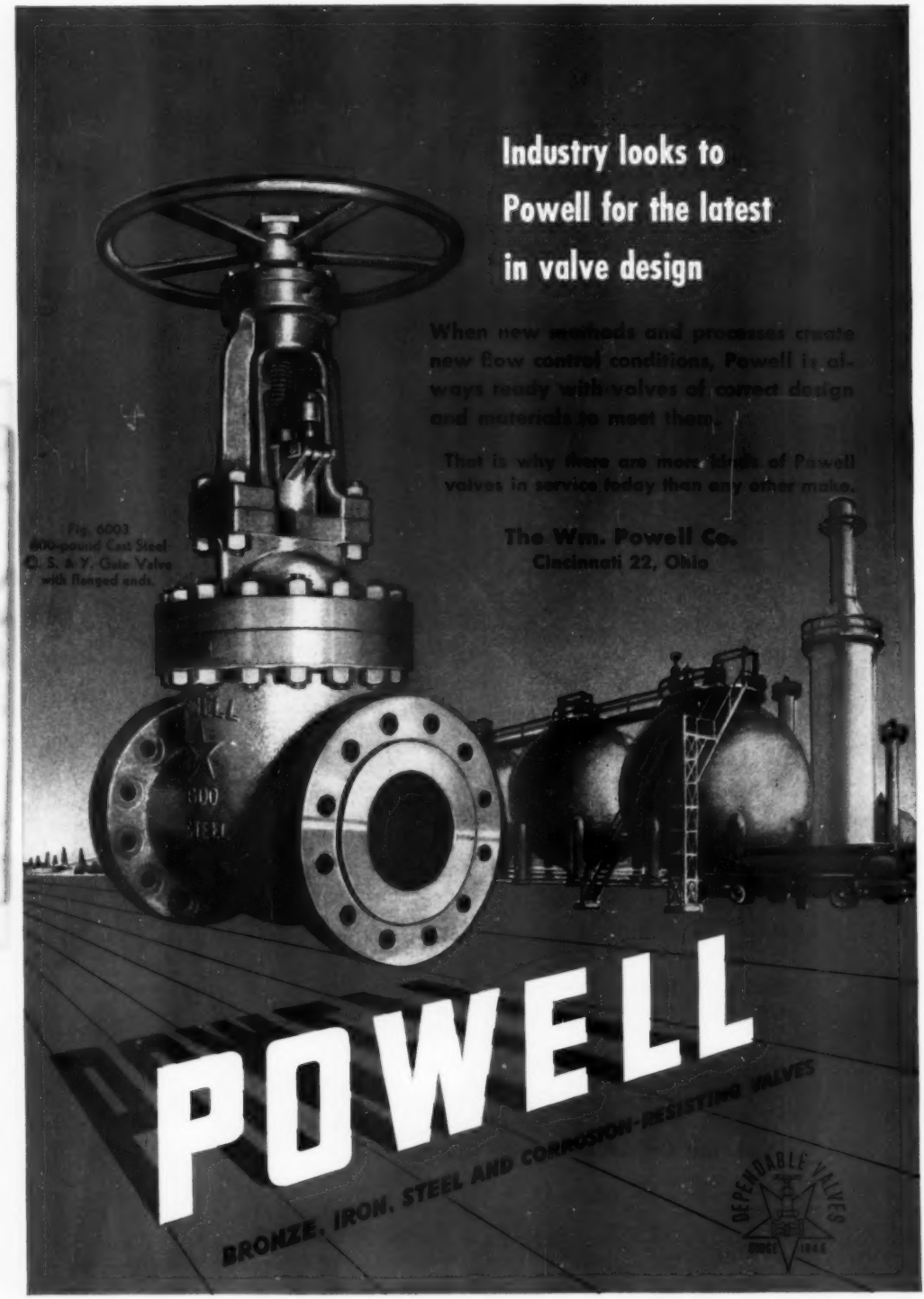
At the first sign of flame the Kidde system releases carbon dioxide (CO_2) which blankets the fire—literally smothers it instantly. You can protect several spaces with a single Kidde system . . . or have separate protection for such hazards as a dip tank or generator.

With a Kidde System, there is no water damage, no messy residue to ruin costly machinery, electrical equipment or documents. And that means no interruption in production. Find out more about Kidde Fire Protection today. Write to:

Walter Kidde & Company, Inc.
154 Main Street, Belleville 9, N. J.

Kidde

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.


Industry looks to
Powell for the latest
in valve design
When new methods and processes create new flow control conditions, Powell is always ready with valves of correct design and materials to meet them.
That is why there are more kinds of Powell valves in service today than any other make.
The Wm. Powell Co.
Cincinnati 22, Ohio
Fig. 6003
600-pound Cast Steel O. S. & Y. Gate Valve with flanged ends.
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1844

FOR PROTECTING YOUR PIPELINES WITH BARRETT* COAL-TAR COATINGS

1. **BARRETT coal-tar enamels** and application procedures are available for every pipe-coating use in the oil and gas field, and for use under all types of climatic conditions and topography.
2. **Barrett makes coal-tar enamels** in grades that will not crack at —20°F., nor flow at 160°F.
3. **BARRETT coal-tar enamels** possess high ductility and flexibility in all grades, and show high resistance to soil stresses.
4. **BARRETT coal-tar coatings** adhere closely to the pipe, and are not damaged by "breathing," nor by deflectional stresses caused by loading of the back-fill.
5. **BARRETT coal-tar enamels** have high dielectric properties—require less "outside" current to make cathodic protection effective.
6. **BARRETT coal-tar enamels** are impermeable to moisture.
7. **BARRETT coal-tar enamels** are resistant to attack by gas and petroleum products.
8. **Another advantage** of BARRETT coal-tar coatings is the widespread experience of the engineers and contractors who have worked with them.
9. **Also, their universal availability** and ease of application, through applicators all over the country.
10. **And last, but not least,** the Barrett organization is always at your disposal to advise on materials and on application procedure, and to consult with you on any pipe-coating problem.

*Reg. U. S. Pat. Off.

Barrett

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Tip to production men

Ask your Christmas tree supplier for

UNIBOLT FLOW MANIFOLDS

PREFABRICATED AND TESTED

LESS WEIGHT

GREATER STRENGTH

LOWER COST

ASSURED DEPENDABILITY

UNIBOLT Flow Manifolds are preferred by many production men because the units of this manifold — Unibolt Adjustable Wing Valve, Unibolt Positive Choke Body, and Unibolt Tee or Cross — may be assembled in a number of combinations to best meet individual requirements . . . The Manifolds are assembled to specifications at the UNIBOLT plant and tested before delivery to your Christmas tree supplier. The Wing Valves can be arranged for flowing with or against the stem, and the Positive Choke Body may be rotated to any desired position to facilitate tying-in with the flowline. It's truly flexible.

Add to this such features as: exclusive "flow-rated" positive beans (regular fractional sizes and "X" sizes) for precise control of well flow, lighter weight, greater strength, lower first cost and maintenance, plus the fact that any of its parts may be safely and easily replaced in the field, and you have the reason why more and more operators are specifying UNIBOLT Flow Manifolds.

Available in regular forged steel or in high — chrome alloy for corrosive wells — 6,000, 10,000 and 15,000 lb. test.

THORNHILL-CRAVER CO.
HOUSTON, TEXAS

This Simple Compressor Meets the Complex Needs of a Changing Petroleum Industry

It's the Nash!

Here is a compressor presenting advantages found in no other device. Nash Compressors have only one moving part, rotating without metallic contact with the pump casing. No internal lubrication is required. Yet they produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure.

There are no valves, gears, pistons, sliding vanes, or other complicated wearing parts in a Nash. Compression is secured by an entirely different principle of operation. Because of this, gas pumping problems difficult with ordinary pumps are often easily handled by the Nash. For example, Nash Pumps are standard equipment in the Synthetic Rubber Industry, where they have met the needs of new and difficult processes.

Nash Compressors are compact and save space. They run without vibration, and compression is without pulsation. They maintain original performance over long periods. Service is assured by a nationwide net-work of Engineering Service offices. Instructive bulletin shows how they operate. Write for it.

One moving part.

No internal wearing parts.

No valves, pistons, or sliding vanes.

No internal lubrication.

Low maintenance.

Slugs of liquid entering pump do no harm.

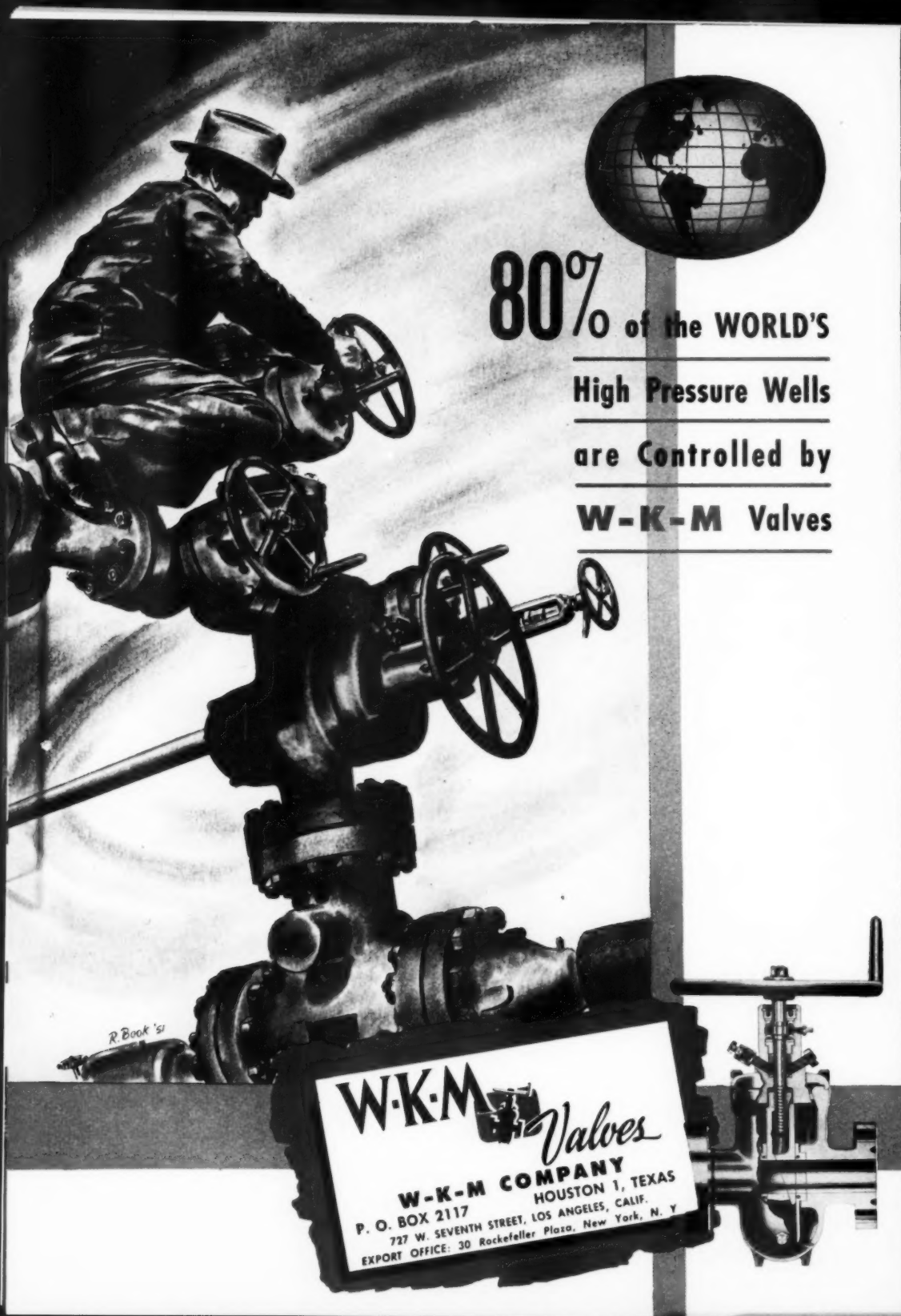
Non-pulsating pressure.

Saves floor space.

75 pounds in a single stage.

NASH ENGINEERING COMPANY

274 WILSON, SO. NORWALK, CONN.


80% of the WORLD'S
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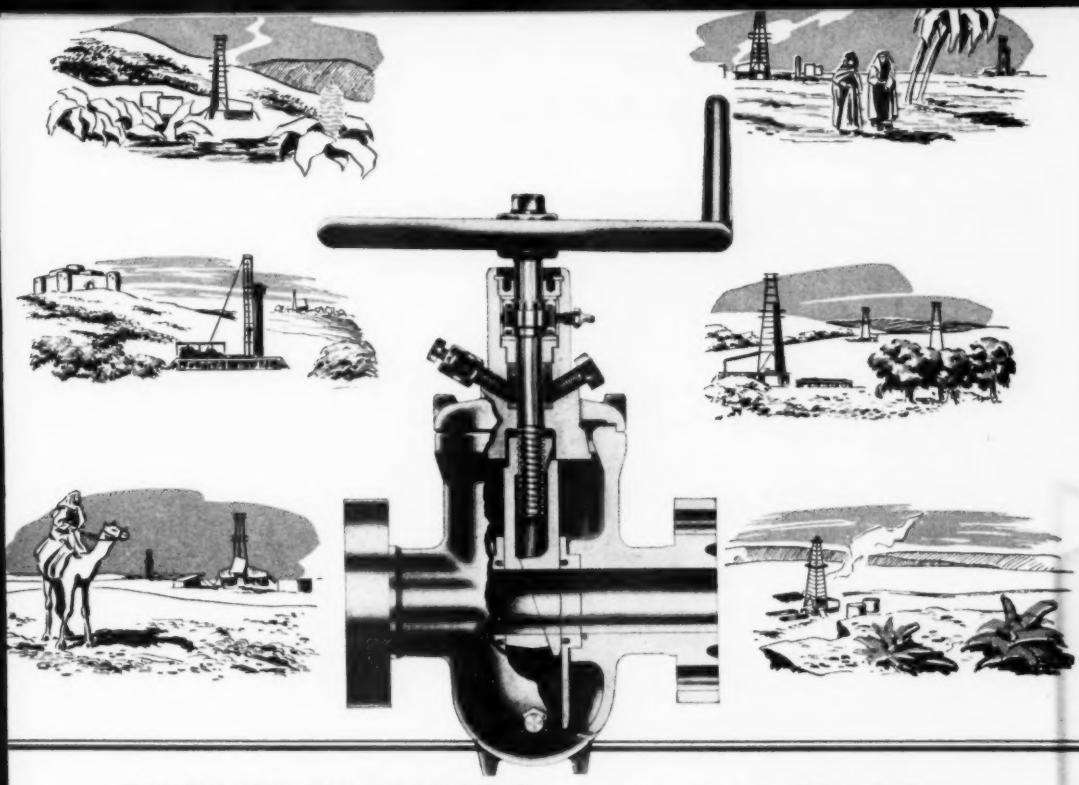

W-K-M VALVES now available from the United Kingdom

World famous W-K-M Christmas Tree and Flow Line Valves are now available from Oil Well Engineering Co., Ltd. for Pounds Sterling payment. They are manufactured to W-K-M's precise specifications by a fine English name in the oil industry, Bolton's Superheater & Pipe Works Ltd. of Stockport.

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BOLTON'S SUPERHEATER &
PIPE WORKS LTD.,
STOCKPORT

Sold by
THE OIL WELL
ENGINEERING COMPANY LTD.,
12 SOUTH PLACE E.C. 2, LONDON
and
W-K-M INTERNATIONAL CORP.
30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

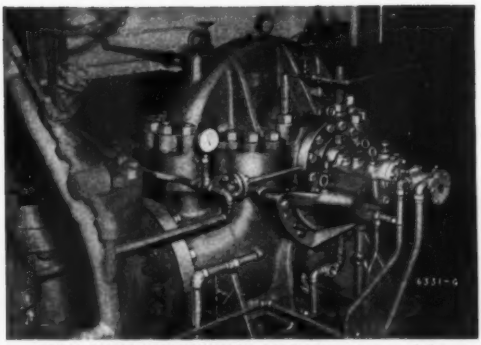
W-K-M

INTERNATIONAL CORP.

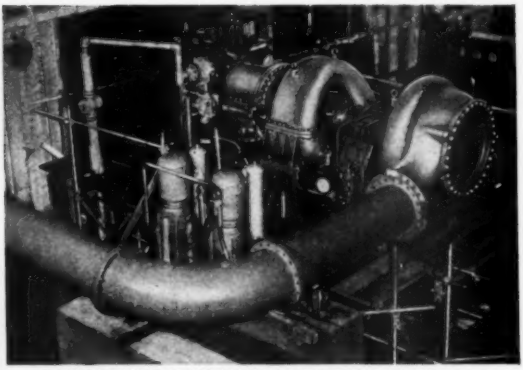
30 Rockefeller Plaza, New York, N. Y.

DE LAVAL CENTRIFUGAL COMPRESSORS

On All 4

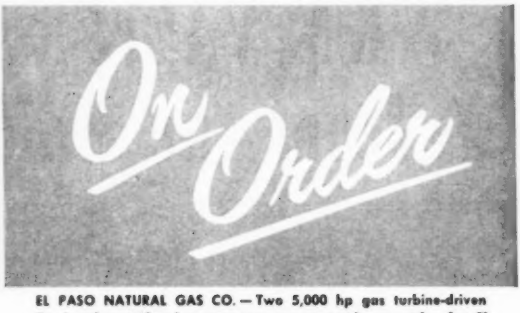


TEXAS EASTERN TRANSMISSION CORP. — Here is one of the many De Laval motor-driven centrifugal compressors originally installed on the Big and Little Inch pipelines.



TRANSCONTINENTAL GAS PIPE LINE CORP. — This is the first steam turbine-driven compressor to go in service. Two other De Laval 5,000 hp units have been installed at station 7, McComb, Miss.

TEXAS EASTERN EXPANSION — Shown is one of 13 new De Laval motor-driven centrifugal compressors being built for Texas Eastern's expansion program.



EL PASO NATURAL GAS CO. — Two 5,000 hp gas turbine-driven De Laval centrifugal compressors are currently on order for El Paso's 26 and 30-inch natural gas pipelines.

Performance records of De Laval centrifugal compressors, used to transmit high pressure gas, have been outstanding. Leakage past the shaft seals has been zero, consumption of sealing oil insignificant and efficiency guarantees have been more than met. These and other important advantages are due to the basic simplicity of the De Laval design.

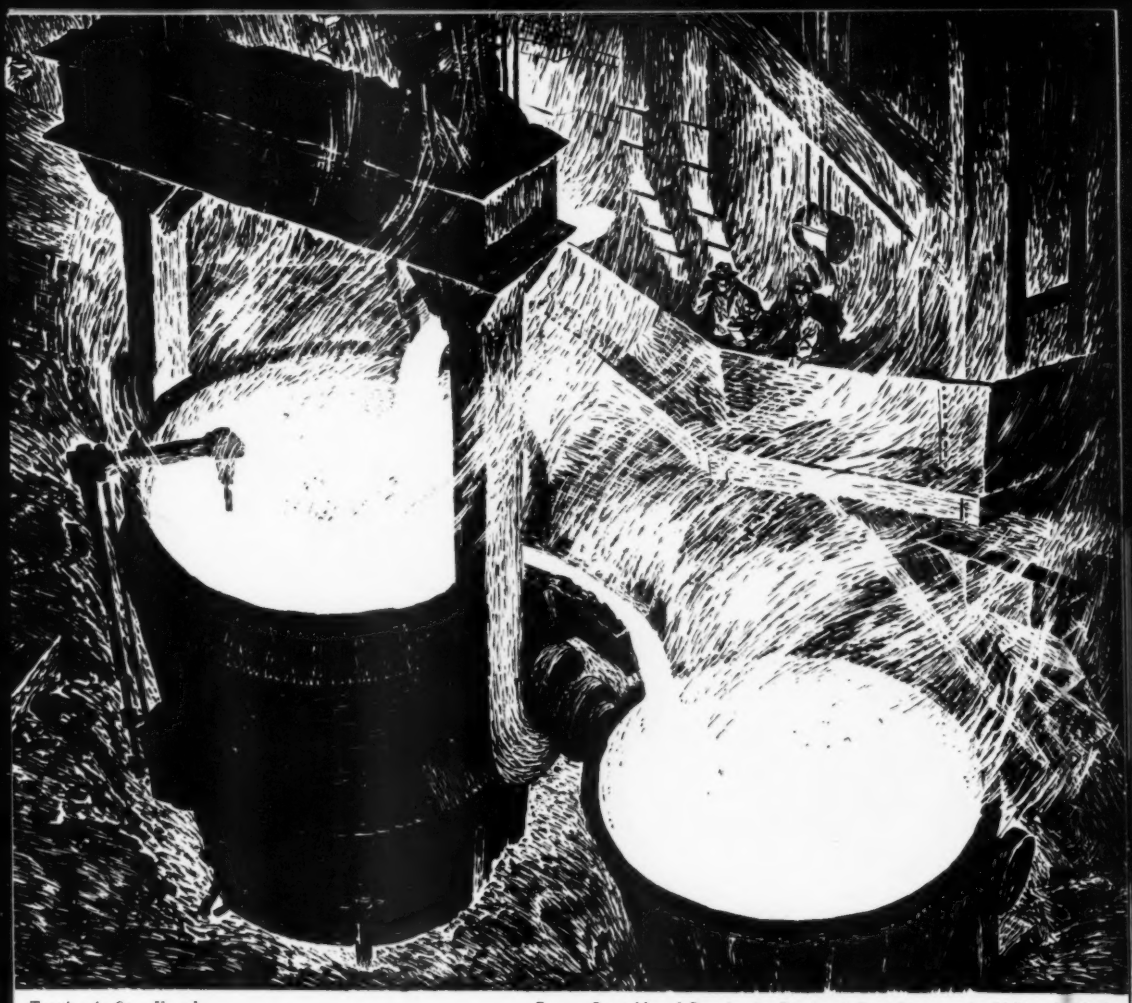
If a careful study of your needs indicates that centrifugal compressors are practical from an economic standpoint, it will pay you to consult our Field Engineer. He will give you the benefit of our experience on all four major pipelines.

50th Anniversary

DE LAVAL *Centrifugal Compressors*

DE LAVAL STEAM TURBINE COMPANY • TRENTON 2, NEW JERSEY

DL-119



Tapping An Open Hearth — *From a Scratchboard Drawing for Pittsburgh Steel Company by William Pendred*

Progress in Steel

The tons of steel gushing from the open-hearth furnace above represents but a small part of the half-million-ton increase in steelmaking capacity that is steadily becoming a reality at Pittsburgh Steel Company. This increase means that fifty percent more steel will be made by Pittsburgh Steel and channeled into strip and sheet, tubular and wire products for the defense of the free world and to serve our daily lives.

A Program of Progress is making this expansion possible at Pittsburgh Steel. It is providing more iron from the blast furnaces—more steel from the enlarged open-hearth furnaces—a new blooming-slabbing mill—a new continuous strip-sheet mill—other finishing mills and facilities are being improved and enlarged as well.

Already the effect of this uncompleted expansion program is being reflected in the increased shipment of steel products from the works of Pittsburgh Steel. Each month records are being broken. Each month goals are being set even higher as the newly enlarged furnaces come into production. Each month Pittsburgh Steel moves closer to completion of its Program of Progress.

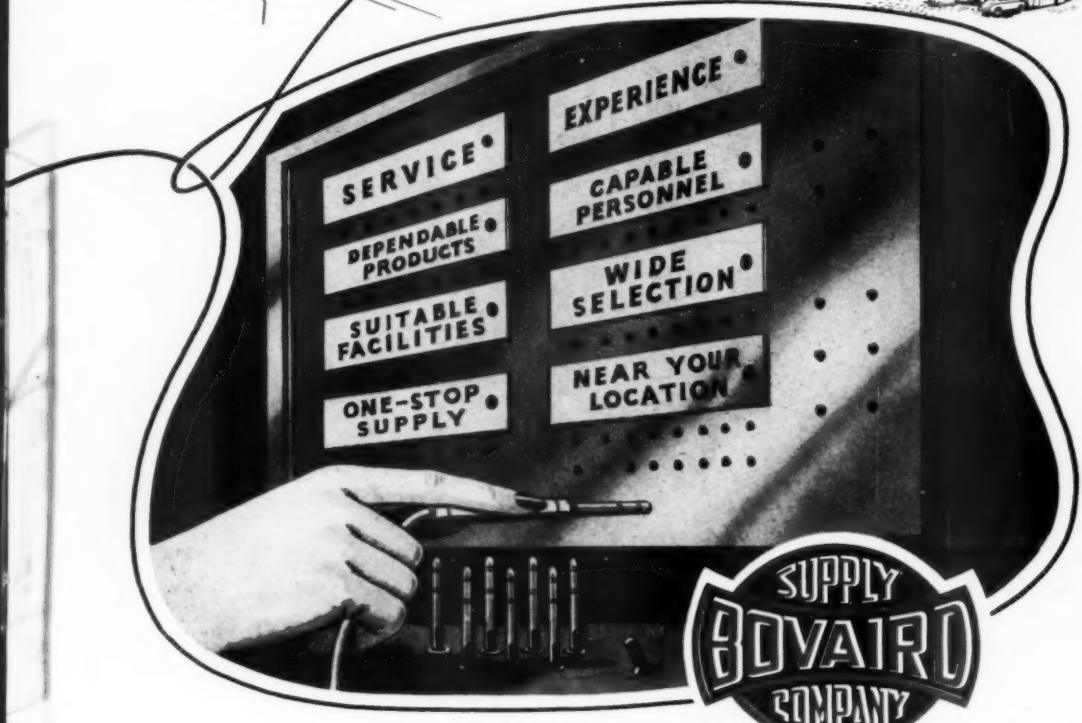
The acceleration of steel production in this unit of the vast steel industry is typical of the activity throughout the Nation today. Steel is needed for defense—steel is necessary in our civilian economy. The steel industry is determined to build so that all may have an ample supply of this vital metal.

Pittsburgh Steel Company

Pittsburgh, Pennsylvania

GIVE Bovaird A CALL...

We Connect you with all



Over 81 years' experience in supplying the oil industry has taught us that — to provide you the best service we must place suitable facilities near your location — that we must "keep posted" on all field conditions and changes to help you select proper equipment and supplies — that we must carry a complete line of modern designed, field-proven products to give you a satisfactory one-stop, ready source of supply. Call Bovaird — you'll be connected with the best.

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THE Bovaird SUPPLY COMPANY

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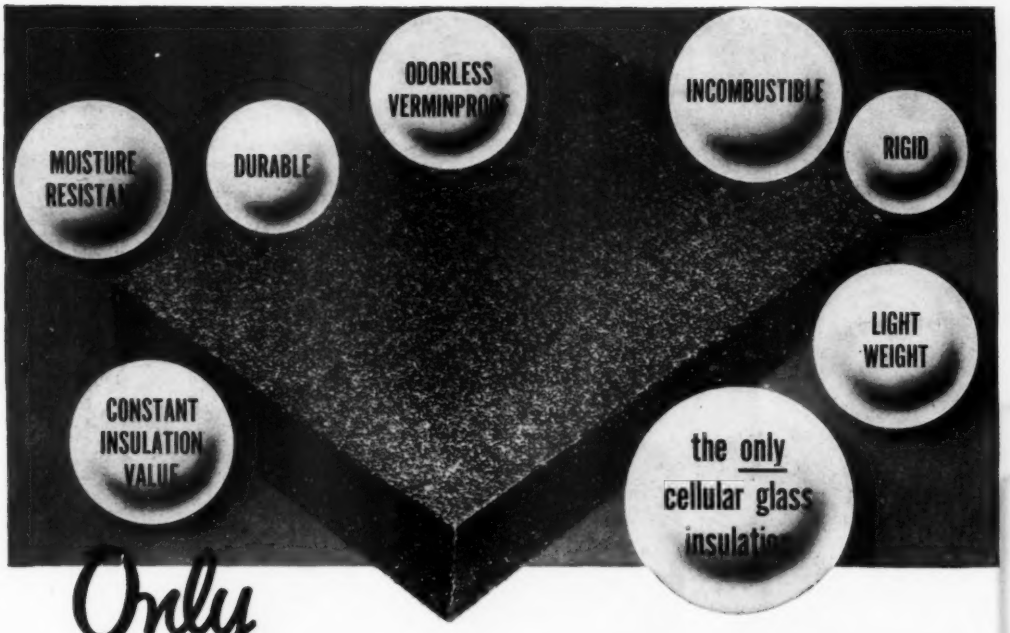
TULSA, OKLAHOMA

81 YEARS OF PROGRESS WITH THE OIL INDUSTRY



Only FOAMGLAS®

gives you all these advantages

FOAMGLAS is the only insulating material composed of millions of tiny glass bubbles containing still air. Still air is the world's best practical insulation. And glass, in this cellular form, has exceptionally high resistance to many elements that cause other insulating materials to deteriorate.

That is why FOAMGLAS, the only cellular glass insulating material, is such an effective, long lasting, economical insulation.

The eight features mentioned above are the main reasons for the rapidly increasing use of FOAMGLAS on hot and cold pipe lines, on tanks, towers, and other processing equipment.

When next you figure on insulation, be sure to get all the advantages you enjoy only with FOAMGLAS. Send the coupon for sample and informative booklet.

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Pittsburgh Corning Corporation
Dept. DD-12, 307 Fourth Avenue, Pittsburgh 22, Pa.

Please send me without obligation a sample of FOAMGLAS and your FREE booklet on the use of FOAMGLAS for Piping and Process Equipment.

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Address.....

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PITTSBURGH CORNING CORPORATION · PITTSBURGH 22, PA.

DAVISON DEPENDABLE CATALYSTS BUILD BETTER MOTOR FUEL

The operating efficiency of synthetic fluid-type cracking catalysts is important. This operating efficiency can be assured by uniformity of physical characteristics and chemical purity. Davison's production of microspheroidal (M-S*) is tops in uniformity . . . providing all users with a highly efficient synthetic fluid-type cracking catalyst. Your requirements can also be supplied in ground (DA-1*) form. Write for further descriptive information. Experienced Davison Field Service Engineers backed up with complete laboratory testing facilities are part of Davison's service.

*T.M.T.D.C.C.

Progress Through Chemistry

THE DAVISON CHEMICAL CORPORATION

Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, SILICOFLUORIDES AND FERTILIZERS

How NAYLOR gives you EXTRA STRENGTH in Light-weight Pipe

If you want to know why Naylor pipe out-performs other light-weight pipe in oil field service, here is just one of the reasons. If you could look inside Naylor's distinctive spiral, you would see the lockseam spiralweld structure which extends in spiral form throughout the length of the pipe. This spiralwelded truss provides greater structural strength—under pressure, compression, collapse, and beam load than any other iron or steel pipe of the same nominal wall thickness. That's why you can use Naylor Pipe on jobs normally requiring heavier-wall pipe. Write for Bulletin No. 507.

NAYLOR PIPE

Naylor Pipe Company
1232 E. 92nd St., Chicago 19, Ill.
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Mid-Continent Supply Company, **Ft. Worth, Texas and Branches**
Exclusive distributors in Mid-Continent and Gulf Coast Areas

They Say—

Wealth Isn't Enough

"Especially in countries where there are great extremes in the wealth of the few and the poverty of the many national averages of annual income are completely useless as a gage of standards of living. Take the Shiekhdom of Kuwait, for instance. This is a small country on the Persian Gulf, with an estimated total population of 150,000.

"A few days ago we read . . . that a new agreement had been reached between the Sheikh of Kuwait and the oil company operating in Kuwait, according to which the Sheikh will now receive an annual income of $150 millions in oil revenues.

"This in itself will put the per capita national income of Kuwait at $1,000—second only to the North American figure — without counting any additional income earned by the Kuwait population. In reality, however, all this enormous wealth remains concentrated in the hands of the Sheikh, while his 150,000 subjects continue to lead a precarious existence on an annual per capita income of probably less than $50.

"The Sheikh of Kuwait happens to be a liberal and benevolent ruler who has already announced important plans for improvements in the social and health conditions of his people, to be financed from his oil revenues. But the fact remains that the per capita national income figure of Kuwait, and of other countries at a similar stage or socio-economic development, is utterly meaningless."

Raphael Patai, Middle East Consultant, Department of Social Affairs, United Nations, in letter to the editor, New York Times.

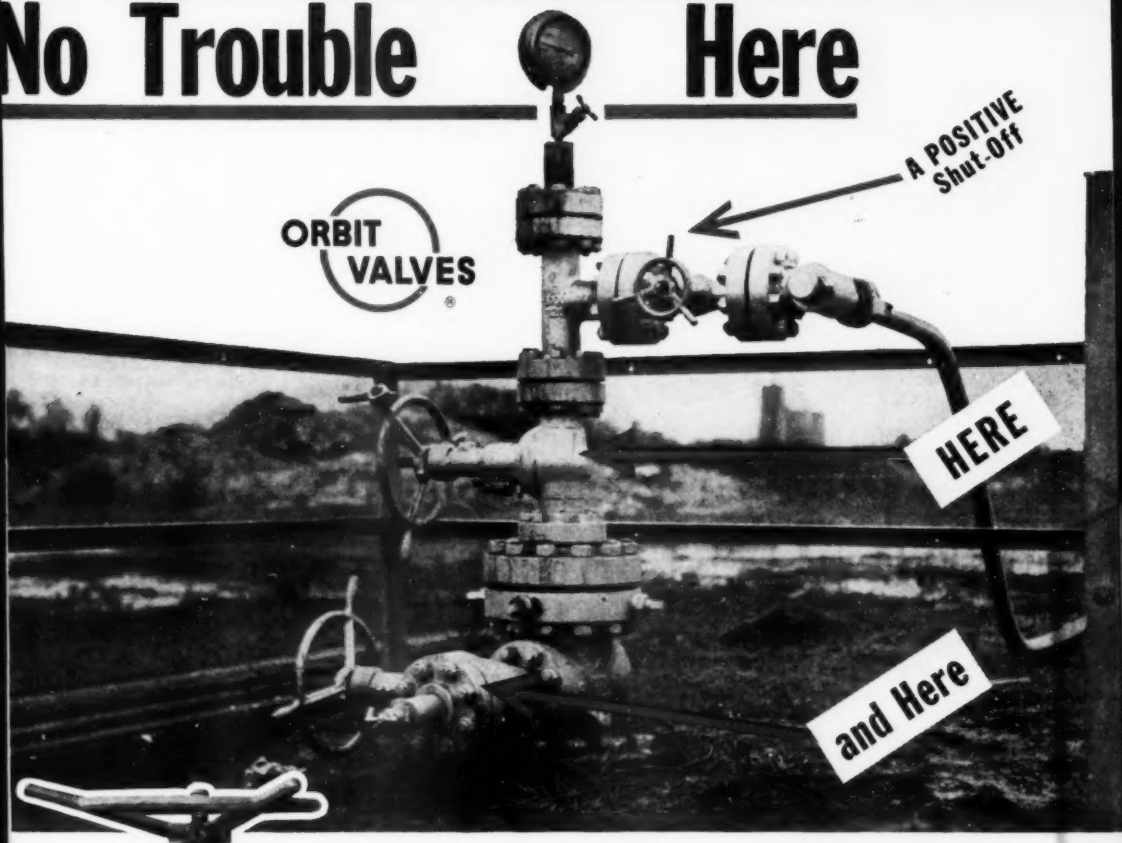
Man-Made-Rubber Pipe Growing

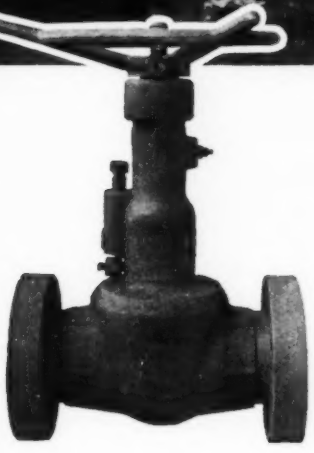
"World production of man-made rubber, about 95 per cent of which is in the United States, is currently at a rate approaching one million long tons a year and may soon exceed 1,100,000 tons annually. At Pearl Harbor, such capacity was only a few thousand tons a year," the rubber company executive said.

"The total world output of crude and man-made rubbers in 1952 should be about 2,900,000 long tons while world consumption is expected to be less than 2,500,000 long tons, thereby making available 400,000 long tons for addition to stocks in 1952.

"We now have, in the United States, all the man-made rubbers that we can effectively consume in the manufacture of civilian and defense products and have built up stocks of suf-

No Trouble Here





Friction Free Seating

—FULL ROUND OPENING

The Orbit Forged Steel Rising Stem Valve utilizes a welded bonnet construction and differs from most conventional type valves, in that the Body and Bonnet of the Valve are securely welded together, using the most modern techniques. This positively assures the absence of gasket leaks, and gasket corrosion from interior or exterior sources. This Welded construction forms the Body and Bonnet into one integral pressure vessel, stiffens and strengthens the entire structure, and offers a streamlined, compact design.

Due to the Orbit principle of resilient, friction free seating-contraction, expansion and vibration will not cause the seating surfaces to separate in the closed position. The body seat is deflected in the closed position a sufficient amount to assure a positive shut-off.

Specify Orbit Forged Steel Production Valves for your next xmas tree

Your Store Carries Orbit Valves in Steel

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HOUSTON, TEXAS
407 Velasco
(Serving the Gulf Coast)

ODESSA, TEXAS
Starr Warehouse
(Serving West Texas)

CASPER, WYOMING
The Great Western Co.
(Serving the Rocky Mountain States and Canada)

ORBIT VALVE CO.

P. O. Box 699 TULSA, OKLAHOMA

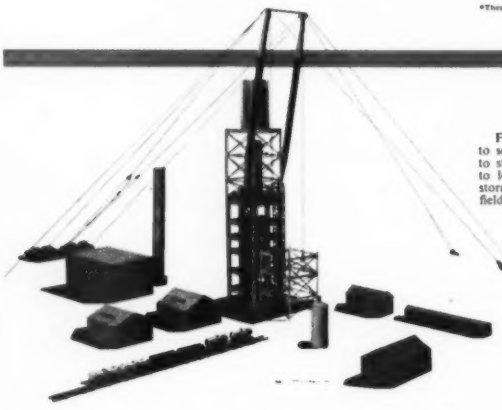
It took 60 years to save three months

on Socony's new cat-cracker*

The cat-cracker, the most important processing unit in a refinery today, is usually built from the ground up like a skyscraper—one or two floors at a time. But Fluor has developed a new time-saving technique of designing the component parts so that they can be fabricated on the ground simultaneously and lifted into place, thereby making more efficient use of manpower and equipment. Construction crews work in perfect coordination on a production-line basis to effect substantial savings in construction costs, but above all *in time!*

Fluor designed and constructed the catalytic cracking unit shown here for Socony-Vacuum at Augusta, Kansas. It stands 268 feet high, equivalent to a 22-story building. Nine months and 13 days after foundation was poured, it went on stream for 15,000 barrels a day, three months earlier than could be normally expected if built by conventional methods under similar circumstances. This airlift TCC unit processes about 1½ million barrels of oil in three months; that's why getting it into operation in the shortest possible time was an all-important objective.

*Thermofor catalytic cracking unit built for Socony-Vacuum Oil Company at their Augusta, Kansas refinery.

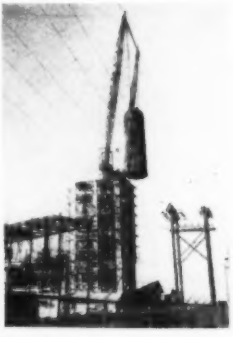


First, an experimental model was built to scale to check basic rigging design, to study actual erection problems, and to locate the most efficient work and storage areas before starting work in the field. The unit stood 5½ feet high.

October 26

Reinforced concrete was used to a height of 100 feet for fire protection. While the base was being poured (August 21, 1950), these concrete panels weighing 85 tons each were being cast on the ground slab.

Here's how it was done— from conception to *Completion*

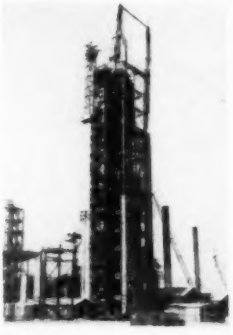


December 22

In spite of sub-zero weather, the building marathon continues. The Reactor weighing 100 tons is being hoisted 100 feet into the air. It took less than an hour to complete this operation. The cracking process takes place in this unit.

January 4

This steel section, assembled on the ground and weighing 110 tons, was lifted 160 feet and lowered into place over the Reactor. It supports the Hot Catalyst Bin. This is one of 28 major lifts varying in weight from 60 to 125 tons.



March 5

After the last steel section was set, the Separator Surge Drum (63 tons) is raised into place on top. This was the last lift to be made. Total height is now 268 feet, 22 stories high, and is one of the tallest structures in Kansas.

May 10

Operation testing completed and ready for start up, 9 months and 13 days after foundation was finished. This cat-cracker is capable of processing 630,000 gallons of oil every day. Fluor has four more similar units under way.

For 60 years Fluor has been building for industry and is among the leaders in plant construction for the oil, gasoline, chemical and power industries in and out of the continental United States. If time-saving is your concern, take time to contact your nearest Fluor district office for details. Write for Bulletin CC2521 describing Fluor activity in the construction of Fluid and Thermofor cat-crackers.

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Engineers - Constructors - Manufacturers

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SINCE 1890

ficient size to permit government authorization for the export of some American-made rubbers to friendly nations.

"Estimated consumption for 1952 is 1,300,000 tons, which if attained will be a new all-time high. Sixty-five per cent of the consumption will be American rubber and 35 per cent crude rubber."

John L. Collyer, president, B. F. Goodrich Co.

Needs for Security

"The ever-present possibility of total war is the industry's greatest concern. Despite its spectacular and continuing expansion it has not been able to build up as large a reserve capacity of crude oil as it had prior to World War II.

"To build this essential reserve, the oil industry needs increased allocations of steel and other materials. It must have adequate incentive, such as the continuation of the statutory depletion allowance, and adequate profits with which to finance its program. Most important, like industry in general, it requires an economic atmosphere in which it can give full play to competitive resourcefulness in meeting the problems ahead."

Robert G. Dunlop, president, Sun Oil Co.

CALENDAR

February

American Society for Testing Materials, Committee D-2 on petroleum products and lubricants, Shoreham Hotel, Washington D. C., February 3-8.

Missouri Petroleum Association, annual convention and trade exhibit, Jefferson Hotel, St. Louis, February 4-6.

Instrument Society of America, New York Section, power-plant symposium, Hotel Statler, New York City, February 7-8.

Western Petroleum Refiners Association, regional technical and industrial relations meeting, Beaumont, Tex., February 7-8.

American Petroleum Institute, Division of Marketing, lubrication-committee meeting, Hotel Book-Cadillac, Detroit, February 18-19.

Wisconsin Petroleum Association, twenty-sixth annual convention and equipment show, Milwaukee Auditorium, Milwaukee, February 26-27.

American Association of Petroleum Geologists, Rocky Mountain Section, annual meeting, Salt Lake City, February 28-29.

Natural Gasoline Association of America, Permian-Basin regional meeting, Lincoln Hotel, Odessa, Tex., February 29.

March

Manufacturers Standardization Society of Valve and Fittings Industry, annual meeting, Hotel Commodore, New York City, March 3-5.

American Society for Testing Materials, spring meeting, Hotel Statler, Cleveland, March 3-7.

Pacific Coast Gas Association, annual technical services conference, Fresno, Calif., March 5-6.

American Petroleum Institute, Division of Production, southwestern district, Washington-Youree Hotel, Shreveport, March 5-7.

National Association of Corrosion Engineers, eighth annual conference and exhibi-

You've Got to
PLAY IT SAFE
When it's Fire or Steam!

In the oil industry, two of the hoses you can't afford to take any chances on are fire hose and steam hose. They've got to be designed for the job, *with an extra margin of safety built in.* No hose that leaves our plant gets more care in construction and inspection than the two below. You can depend on them for long, trouble-free *safe* service.

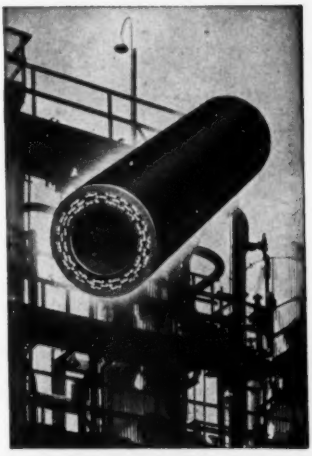
Maltese Cross® Fire Hose . . . . .

The "standard of comparison" with oil refineries for over 80 years . . . unexcelled for foam, chemical or booster use.

The tough cover protects Maltese Cross from oil film, acid fumes and chemicals . . . stops water absorption into the carcass . . . prevents mildew and eliminates need for drying-out after use. Inside is a mildew-inhibited, closely woven duck carcass that provides unusual durability and burst-resistance. Yet Maltese Cross is light, flexible, easy to coil, folds closely.

Fifteen years of active fire-fighting service, plus many more as a utility or clean-up hose, are what you can expect —*and get*—when you play it safe with Maltese Cross.

Monarch® Fiberglas* Steam Hose



Monarch is built to carry saturated steam at temperatures up to 388° F. and pressures up to 200 lbs. . . . and do it day in and day out without failure. The tube is an exclusive Hewitt-Robins development—a special heat-resisting compound that stays soft and flexible without flaking or cracking.

The carcass is multiple-braided Fiberglas cord—unsurpassed for heat resistance and strength—and heavily insulated with heat-resistant rubber. The cover is extra-tough, extra-thick, won't strip or blister . . . highly resistant to heat, abrasion and weather.

For general steam services in the oil industry — insist on Monarch Fiberglas Steam Hose!

* * *

For these and many other specialized oil industry hoses, call your Hewitt Rubber Distributor (listed under "Rubber Products" in the classified 'phone book), or write Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, New York.

*T.M. of Owens-Corning Fiberglas Corp.

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OIL INDUSTRY HOSE

HEWITT-ROBINS HR INCORPORATED

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FLUE CLEANING HOSE • FUEL OIL & GASOLINE HOSE • OIL SUCTION & DISCHARGE HOSE
STEAM HOSE • TRUCK TRANSPORT & TANK CAR DISCHARGE-SUCTION HOSE • TANK TRUCK HOSE
TWIN-WELD® WELDING HOSE • PROPANE-BUTANE HOSE FOR HANDLING LIQUEFIED PETROLEUM GASES
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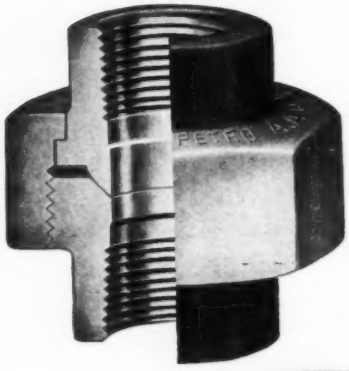

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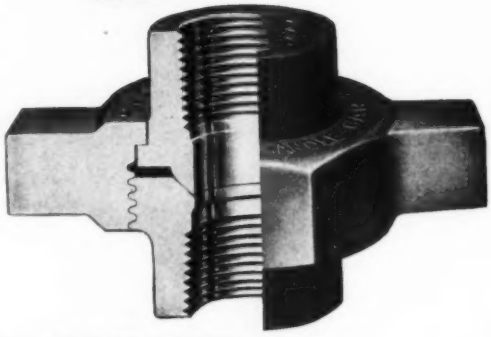

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tion, Galvez Hotel, Galveston, Tex., March 10-14.

Illinois Petroleum Marketers Association, annual convention, Hotel Sherman, Chicago, March 11-13.

Texas Oil Jobbers Association, Inc., annual spring convention and refiners and suppliers exhibit, Hotel Adolphus, Dallas, March 12-13.

American Institute of Chemical Engineers, regional meeting, Atlanta, March 16-19.

Ohio Petroleum Marketers Association, annual convention and marketing exposition, Deshler-Wallick Hotel, Columbus, Ohio, March 18-20.

American Petroleum Institute, Division of Production, Mid-Continent district meeting, Broadview Hotel, Wichita, Kans., March 19-21.

American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, and Society of Exploration Geophysicists, joint annual meeting, Biltmore Hotel, Los Angeles, March 23-27.

Texas Independent Producers and Royalty Owners Association, sixth annual meeting, Fort Worth, March 27-28.

Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, March 31-April 2.

Mid-West Gas Association, annual meeting, Hotel Radisson, Minneapolis, Minn., March 31-April 2.

April

Pacific Coast Gas Association, annual transmission conference, Berkeley, Calif., April 2-3.

American Petroleum Institute, Division of Production, eastern district, Hotel William Penn, Pittsburgh, April 2-4.

Florida-Georgia Gas Association, annual convention, Soreno Hotel, Saint Petersburg, April 3-5.

Missouri Liquefied Petroleum Gas Association, Hotel President, Kansas City, Mo., April 7-9.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, April 8-10.

Petroleum Industry Electrical Association and Petroleum Electrical Supply Association, twenty-fourth annual joint conference, Mayo Hotel, Tulsa, April 14-17.

American Institute of Electrical Engineers, District 7 meeting, Hotel Jefferson, St. Louis, April 15-17.

National Petroleum Association, semiannual meeting, Hotel Cleveland, Cleveland, April 16-18.

American Petroleum Institute, Division of Transportation, pipe-line conference, Blackstone Hotel, Fort Worth, April 21-23.

American Petroleum Institute, safety and fire-protection committees, Hotel Texas, Fort Worth, April 21-24.

American Petroleum Institute, Division of Production, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., April 24-25.

Indiana Gas Association, annual meeting, French Lick Springs Hotel, French Lick, Ind., April 24-25.

Independent Petroleum Association of America, midyear meeting, Deshler-Wallick Hotel, Columbus, Ohio, April 28-29.

Southern Gas Association, annual convention, Galveston, Tex., April 28-30.

American Oil Chemists' Society, spring meeting, Shamrock Hotel, Houston, April 28-30.

American Institute of Electrical Engineers, District 1 meeting, Binghampton, N. Y., April 30-May 2.

Natural Gasoline Association of America, annual meeting, Rice Hotel, Houston, April 30-May 3.

May

American Geophysical Union, thirty-third annual meeting, National Academy of Sciences, National Research Council, Washington, D. C., May 5-7.

American Institute of Chemical Engineers, regional meeting, French Lick, Ind., May 11-14.

American Association of Petroleum Geologists, regional meeting, Mayo Hotel, Tulsa, May 12-13.

American Gas Association, Natural Gas

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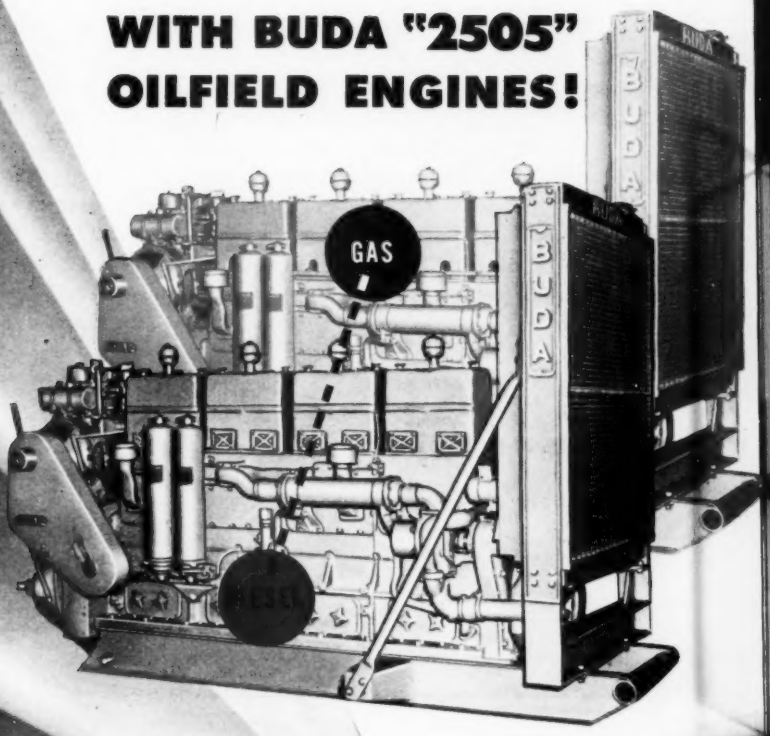

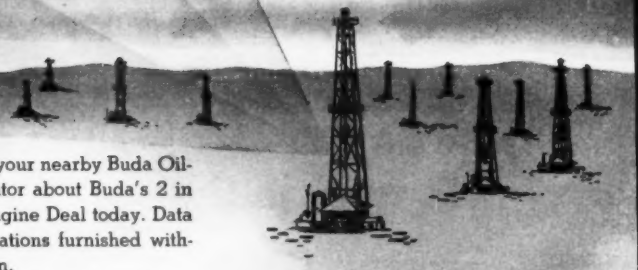

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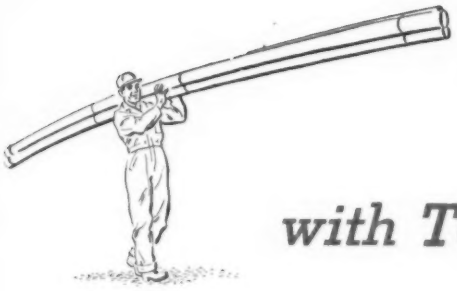

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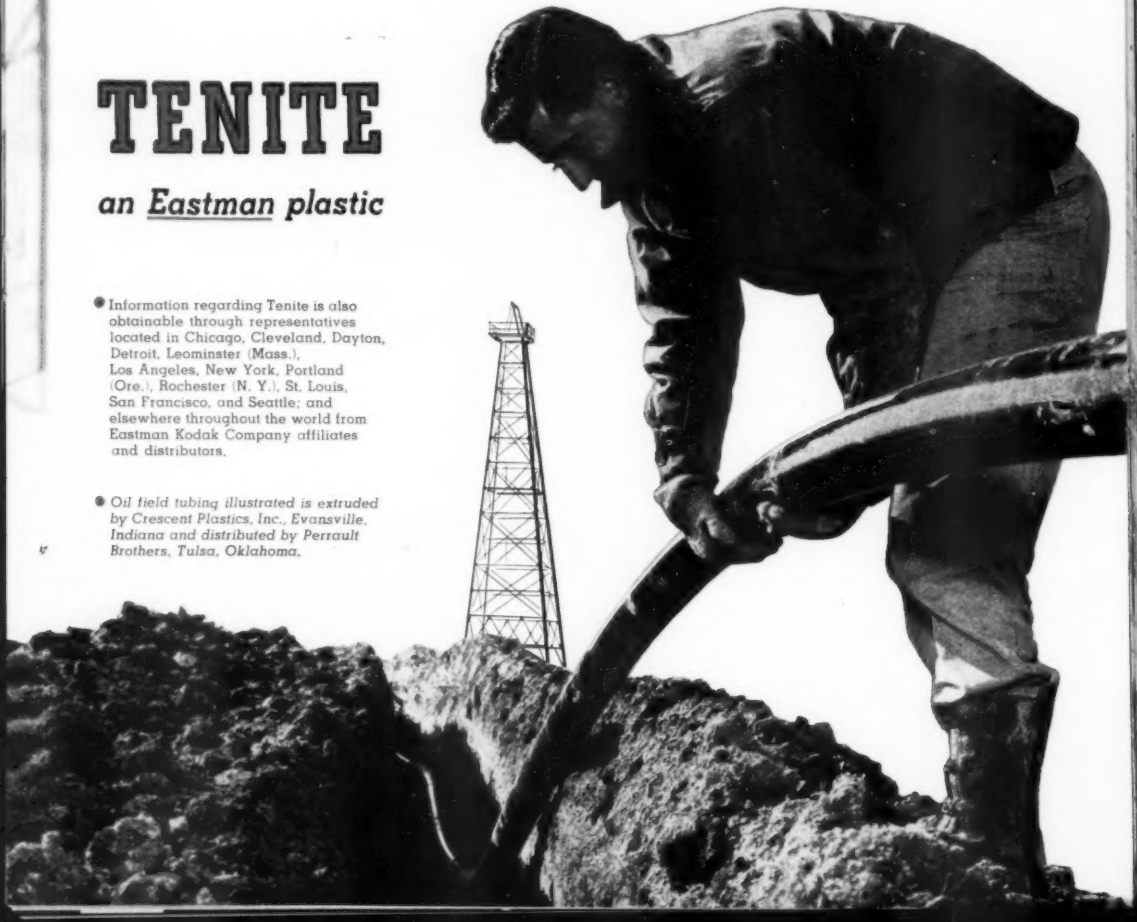


Department, spring meeting, Biltmore Hotel, Los Angeles, May 12-13.

Annual Liquefied Petroleum Gas Association convention and trade show, Palmer House, Chicago, May 12-14.

American Petroleum Institute, Division of Refining, seventeenth midyear meeting, San Francisco, May 12-15.

Pennsylvania Gas Association, Wernersville, Pa., May 13-15.

American Petroleum Institute, Division of Production, Pacific Coast district, Biltmore Hotel, Los Angeles, May 15-16.

American Petroleum Institute, division of marketing, midyear meeting, Copley Plaza, Boston, May 18-19.

Gas Appliance Manufacturers Association annual meeting, Broadmoor Hotel, Colorado Springs, Colo., May 21-23.

American Gas Association, production and chemical conference, Hotel New Yorker, New York, May 26-28.

Society of Exploration Geophysicists Gulf Coast regional meeting, Rice Hotel, Houston, May 29-30.

Seventh annual short course in gas technology, sponsored by the Southern Gas Association, Texas College of Arts and Industries, Kingsville, Tex., May 29-31.

June

Society of Automotive Engineers, summer meeting, Ambassador and Ritz-Carlton Hotels, Atlantic City, N. J., June 1-6.

Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh, June 5-6.

Canadian Gas Association, Chateau Frontenac, Quebec, June 8-12.

American Petroleum Institute, midyear standardization meeting, Brown Palace Hotel, Denver, June 9-14.

International Gas Conference, Brussels, Belgium, June 16-22.

Kentucky Oil and Gas Association, annual meeting, Hotel Lafayette and Phoenix Hotel, Lexington, Ky., June 19-20.

Petroleum Equipment Suppliers Association, Mark Hopkins Hotel, San Francisco, June 22-25.

American Society for Testing Materials, annual meeting, Hotel Statler, New York, June 23-27.

September

Pacific Coast Gas Association, Ambassador Hotel, Los Angeles, September 3-5.

National Petroleum Association, fiftieth annual meeting, Hotel Traymore, Atlantic City, N. J., September 10-12.

American Institute of Chemical Engineers, regional meeting, Palmer House, Chicago, September 11-13.

American Association of Oilwell Drilling Contractors, annual meeting, Skirvin Hotel, Oklahoma City, September 28-30.

October

Texas Mid-Continent Oil and Gas Association, thirty-third annual meeting, Hotel Texas, Fort Worth, October 13-15.

Independent Petroleum Association of America, annual meeting, Mayo Hotel, Tulsa, October 20-21.

Southern Gas Association, annual convention, Atlantic City, N. J., October 27-30.

December

American Institute of Chemical Engineers, annual meeting, Hotel Cleveland (Hqs.) and Carter Hotel, Cleveland, December 7-10.

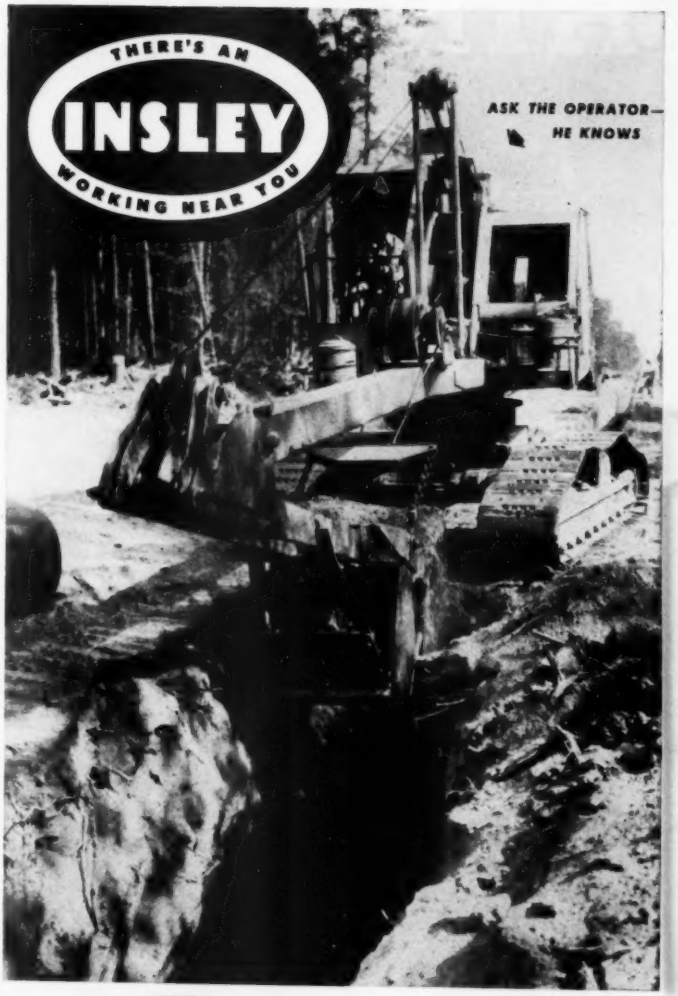
NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas-Fort Worth Nomads, first Monday of each month, Greater Dallas Club.

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club. Annual inaugural ball, Embassy Room, Ambassador Hotel, February 16.



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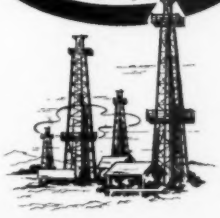

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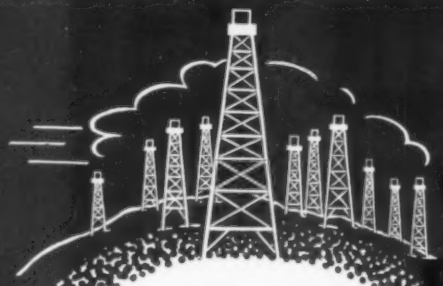

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JOURNALLY *Speaking*

Fancy Figures

FIGURES, figures, figures — that's what this issue has got practically nothing else of but. Our figure experts figured the oil industry from every angle they could think of, and if there are any additional or better figures available anywhere we can't figure what they might be.

If you are one of those unfortunate people who have trouble with figures we sympathize with you (ourself, we can't remember a telephone number long enough to dial it), but you will have to admit that figures are rather important things in connection with any business. And if you're in the oil business (and you must be or you wouldn't be reading this), you never know when you might need to put your finger on some figure about oil. And when you do, we'll bet you can find that figure right in this annual review and forecast issue of our favorite oil publication.

For instance, say your Aunt Minnie still owns the old farm Grandpa homesteaded and she wonders if it will ever be valuable for oil; you look in this issue of the Big Yellow Book and learn exactly how many wildcats were drilled in that county last year and how many of them discovered oil or gas. Or, say you're president of a big integrated oil company and you want to know where to build your next pipe line and refinery; this issue tells you the wells, production, and reserves of each area and the amount of drilling scheduled for the coming year. Or maybe you have to make an Oil Progress Week speech before the West End Ladies Club; you thumb through the Oil Man's Bible and memorize a few salient statistics about how big the oil industry is and your speech is half written.

All we're trying to say is that there are hundreds of ways in which any oil man can make good use of the figures in this book. If we didn't know this for sure we wouldn't go to all the trouble of compiling them every year. And believe us, it is plenty trouble. A lot of these figures we collect all during the year and a lot more we get from a fast survey of the industry right around New Year's Day. It's quite a chore, but we know it's worth it because so many of our readers tell us they use our figures all through the year.

Greatest Show on Earth

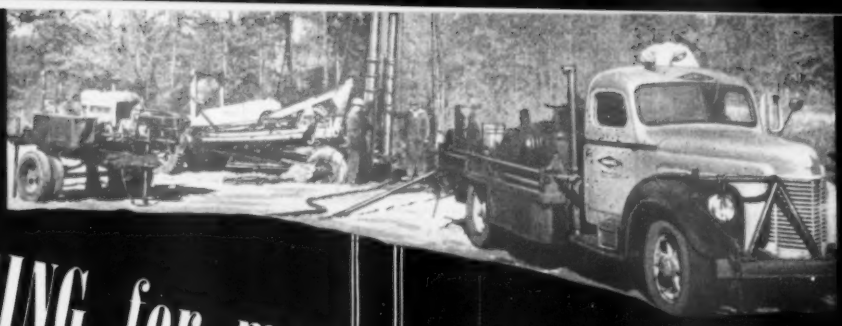
WELL, we did it again. For the third consecutive year we have given you the biggest magazine in the world. Modesty might prevent us from saying this on our own hook, but the figures have already been published by Advertising Age, a magazine which keeps tab on publications and advertising media of all sorts.

During 1951, according to Advertising Age, The Oil and Gas Journal carried 7,131 pages of advertising, which is a larger number than the advertising pages of any other magazine of any kind published anywhere. The nearest competitors were Iron Age, American Machinist, Steel, Saturday Evening Post, Engineering News Record, and Life, in that order.

The man in the street usually thinks of the popular magazines as being tops in the publishing field. They are, of course, in circulation (and in rates charged for their advertising) but not in number of pages printed during the year. Saturday Evening Post, for example, carried 4,362 pages of advertising last year, which makes it a whole lot smaller than the Big Yellow Book. The fact that so many business papers outrank popular magazines in size shows that industry is really the big market for those who have things to sell. And the fact that an oil paper tops them all shows that the petroleum industry is just about the biggest market in the world. And the fact that our favorite oil publication is the one preferred by the most people who have the most to sell to this big market is, well, gratifying, to say the least.

These advertisers in the Journal last year spread before you the greatest display of wares and services ever offered anybody, anywhere, anytime. And in addition our editors dished out for you 4,500 pages of red-hot, live-wire editorial material about the fast-moving, ever-expanding petroleum industry, so that you readers have had a ringside seat at the greatest show on earth—stupendous, magnificent, astonishing, unparalleled. But keep your seats; you ain't seen nothin' yet.

— *Henry D. Ralph.*



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January 28, 1952

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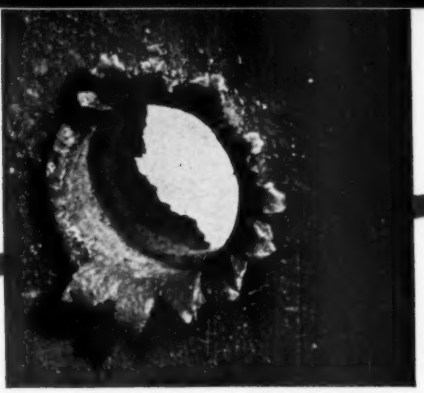

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...until the "working surface" of your casing is clean

This typical burr resulting from a gun-shot hole, clearly shows why so many operators always consider it a "must" to clean the WORKING SURFACE—the vital inner wall of casing—with the new Baker ROTO-VERT Casing Scraper.

It is easy to see why tools with rubber cups, or a rubber packing element, many times fail to set properly, and often are cut, torn and hopelessly damaged while running-in the well. Ninety-nine times out of a hundred, premature setting of packers, testers and retainers, or their failure to effect a leak-proof pack-off, is due *not* to faulty construction or operation of the tool, but to burrs, cement, hardened mud, or other obstructions which . . . PREVENT PASSAGE OF THE SLIPS • CUT OR OTHERWISE DAMAGE THE PACKING ELEMENT; *or* • PRESENT SUCH A ROUGH, UNEVEN SURFACE THAT A LEAK-PROOF PACK-OFF IS IMPOSSIBLE.

The new Baker Model "C" ROTO-VERT Casing Scraper is a helix-blade-type scraper which can be either rotated or "spudded" (reciprocated vertically) for the removal of perforation burrs, imbedded bullets, cement sheath or other obstructions from the inner wall of casing. The body is machined from bar stock, with two sets of machined (not cast) blades positioned for overlapping, 360-degree scraping coverage.

The direction and angle of shear of the deeply hard-faced cutting edges is *exactly opposite* from other helix-blade-type scrapers, which means that the scraping edges of the ROTO-VERT will not "screw down" past burrs, but will actually *shear away* burrs, cement and other obstructions.

CHOOSE THE BAKER CASING SCRAPER EXACTLY RIGHT FOR YOUR WORK

The new ROTO-VERT Scraper is at its best where hundreds of burrs, with possible imbedded bullets, or unusually long stretches of hardened cement must be removed. It operates successfully *with* or *without* rotary equipment.

For normal scraping, where rotary equipment is present, the time-tested Baker Model "B" Casing Scraper, Product No. 620-B, continues the popular choice of many operators.

Why not get in touch with your nearest Baker representative and secure specific recommendations for your next job? Or send for the new illustrated 28-page booklet which contains complete information on the important subject of Casing Scraping the Baker Way.

BAKER OIL TOOLS, INC.

Houston • Los Angeles • New York

BAKER
MODEL "C"
ROTO-VERT
CASING SCRAPER
PRODUCT NO. 620-C

Scrapes the "WORKING SURFACE" of your casing CLEAN and SMOOTH

How Oil Plans

We haven't heard so much talk about "planned economy" lately, but the subject is far from dead in this and other countries. So it is instructive to examine the petroleum industry's planning for its segment of the economy. The general outlines and many of the details of oil's plan of operations for 1952 are presented in this annual review and forecast issue of the Journal.

This is not a government plan. The Government helped some in forecasting demands for petroleum products and hindered some by imposing over-all limitations on the quantity of steel to be available for oil operations; but it is industry's plan. And it is not a plan prescribed by a small group in an ivory tower, but the conglomerate judgment of scores of individual firms.

These separate planners didn't consult each other or a central authority. Each decision on how many wells to drill and where to drill them and on the other construction and expansion projects scheduled for this year was based on the individual operator's circumstances and on his evaluation of business trends and conditions. The final programs were not submitted to any authority nor consolidated into any master plan; they are seen as a whole only when compiled by some independent reporting agency.

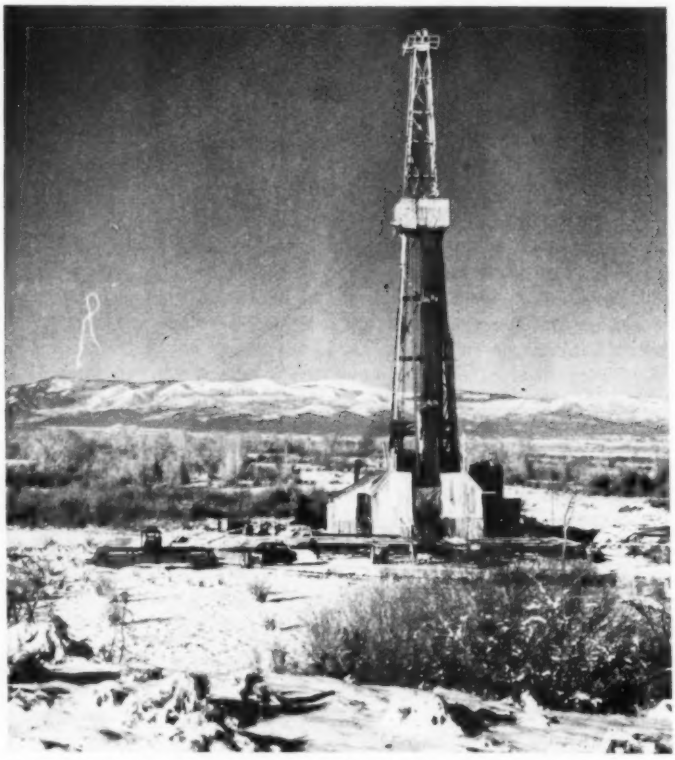
This is free economy in operation. How does it work out? A lot of confusion, uncertainty, imbalance, working at cross purposes, too much of one thing and not enough of another, danger of shortage or oversupply? Not at all, surprising as it may seem to advocates of planned economy.

Every company, large or small, has access to figures which indicate the probable demand for petroleum products. Each is free to make its own interpretation of such figures, but the composite judgment of the many has proved to be a remarkably reliable guide. Each operator then decides how much of this market he will attempt to supply without overextending himself. The result always has been that consumers are assured of an adequate supply at fair and stable prices while every operator has a chance to hold or enhance his position in the industry.

So now we have the outlines of the oil industry's plan for 1952. It is a big and courageous plan, calling for expansion of activity and facilities in every division. But it is a plan which hundreds of the best minds in the business believe is well suited to the nation's needs and to the industry's abilities and best interests. It is a highly flexible plan. Any company can change its portion of it at any time, and the constant minor adjustments keep the plan geared to the needs of the moment.

It might be a lot easier and more comfortable for every operator to be relieved of the responsibility of doing his own planning, to just sit back and wait until some planning agency tells him where to drill and what facilities to build. But that wouldn't be the oil business and that wouldn't be America—and that kind of planning wouldn't guarantee that there would be enough oil when and where needed. Oil's planning does.

THIS WEEK



A GREAT YEAR FOR WILDCATTING.—The oil industry will drill 10,931 wildcats—one-fourth of the 45,446 wells scheduled—in 1952, many of them like this remote Utah test of Carter Oil Co. The industry also plans to expand activity in all its other divisions. Details of this program and the box score on 1951 may be found in this issue beginning on page 205.

PRODUCTION.—World crude-oil output drops 26,000 bbl. to 11,594,000 bbl. daily in November due to U. S. decrease. . . . Foreign areas show considerable increases, however. . . . ¶Texas Railroad Commission grants Sohio Petroleum permission to run tests in Spraberry area to determine whether a well will drain an area of 80 acres. . . . ¶Honor Rancho, Castaic Junction fields in California loom as best oil finds since Cuyama. . . . ¶Oil discovery in southern Alabama near Florida Panhandle to revive interest in that area. . . .

INDUSTRY.—International Petroleum Exposition will be held in Tulsa next year if equipment manufacturers now being polled agree to recommendation of I.P.E. executive committee. . . . ¶Penn Grade group told that depressed crude prices have reduced level of drilling operations, threaten to curb future crude output. . . . ¶U. S. Supreme Court to review decision of Oklahoma court that state's unitization law is constitutional. . . .

OUTLOOK.—Journal survey reveals that petroleum industry expects to spend 3.9 billion dollars this year on capital investments in U. S. on all phases of operation. . . . This represents a gain of 30 per cent over 1951. . . .

NATURAL GAS.—Dehydration of natural gas to meet transmission-line requirements presenting increasing problem to operators. . . . ¶Officer of one gas company predicts we're running out of gas, and natural-gas industry will be out of business within 27 years unless large new sources are found. . . . ¶Gas-production plan being studied for new Oriskany field in Washington County, Ohio, would provide for production of wells only during winter months. . . .

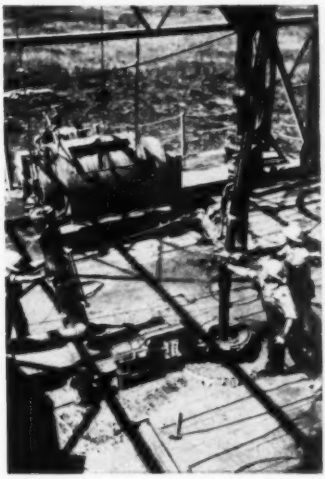
WASHINGTON.—President, in seeking 85.4 billion dollars during fiscal year for budget operations, raises allocations for agencies dealing with oil and gas. . . . ¶Tidelands interim-operation legislation sent to Senate floor. . . . ¶PAD resumes issuance of weekly reports on exports of major petroleum products. . . . ¶NPC to meet this week for election of chairman, adoption of budget for coming year. . . .

OCTANES.—"Built-in octanes" in form of specially compounded collection of mineral catalysts cast into combustion chamber offer promise of improving performance of future internal-combustion engines, developers claim. . . . ¶Du Pont survey reveals that despite cut in use of TEL, both premium and regular-grade gasolines have higher octane number than at the end of third quarter last year. . . .

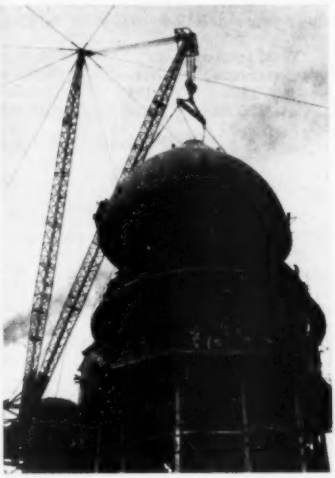
INTERNATIONAL.—Top management of Aramco will transfer to Saudi Arabia as move toward closer relationship between company and country. . . . ¶Britain reported offering to buy 500,000 bbl. of oil daily from Iran at $1.10 per barrel. . . . ¶New French products line scheduled to go into operation this fall. . . . ¶A.I.O.C. will locate Australian refinery at Freemantle on western coast. . . .

ACTIVITY.—Production of crude and lease condensate averaged 6,193,940 bbl. daily for week ended January 19, up 5,945 bbl. daily. . . . ¶Total well completions amounted to 861 compared with 873 last year. . . . ¶Wildcat completions totaled 202, down 3 wells from previous week but up 5 from last year. . . . ¶Rotary rigs operating in United States decreased for the fifth successive week to 2,778 on January 21. . . .

TRENDS.—Production of crude and lease condensate for February is forecast at about 6,360,000 bbl. daily. . . . Crude imports will raise new supply to about 6,860,000 bbl. daily. . . . Allowing for crude exports and losses, the crude supply will permit refinery runs of about 6,775,000 bbl. daily with no reduction in crude inventories.



MR. BIG NO. 1.—In 1952, drilling-production are first with $2,200,000,000.



MR. BIG NO. 2.—Petroleum refining will require a hefty $800,000,000.

More Money for Oil

Petroleum industry to pour $3,900,000,000 into capital investments in U. S. during 1952, a gain of 30 per cent

Kenneth B. Barnes

THE petroleum industry this year will spend $3,900,000,000 for capital investments in exploration, drilling, producing, refining, transportation, and marketing. The figure is only for operations in the United States.

This is a healthy jump, indeed—nearly 1 billion dollars—over the 3 billion dollars which the oil business put forth for capital expenditures in the major industry divisions in 1951. And 1951's investment of 3 billion dollars, itself, was a record breaker for capital expenditures.

The Oil and Gas Journal's estimate of $3,900,000,000 for 1952 was obtained from a special poll of representative oil companies. These were all integrated concerns, large and small, and representative of drilling, producing, refining, and pipe-lining firms in all operating areas of the country.

Excellent cooperation from the companies was received for the Journal's questionnaire, and it was possible for the Journal to project the companies' 1952 budget figures to a 100 per cent total for United States oil operations as a whole. In making these projections to 100 per cent totals, several different reliable indices were used, including barrels of crude-oil production, barrels of present refining capacity, barrels transported, and volumes marketed.

Factors involved.—Three factors have a decided bearing on the $900,000,000 jump in investments (a 30 per cent increase) which the oil business will make this year over last.

. . . Demand is increasing. This means a need for more crude producibility and more crude-oil reserves, therefore more drilling and more exploration. The demand figures for 1952 are detailed in several different categories and classifications in the special "Annual Section" beginning on page 205 of this issue.

. . . Costs are rising.—True, the industry is employing better and more efficient equipment and processes than ever before. But rising costs start with the raw materials going into these items, and other costs are increasing all along the line.

. . . Product improvement. — Again oil companies are spending much money to provide improved products and services. This effort, which directly benefits virtually every consumer in the country, is a part of the increased investment cost the oil business will make in 1952.

Drilling and producing.—This activity, including budgets for exploration, will take the lion's share of the total. Expenditures in the drilling-producing category during 1952 will total approximately $2,200,000,000. Most companies report that they will aggressively continue their exploration and development programs.

It now appears that all of the proven drilling and producing regions in the United States will go along under full-force development in 1952. But much of this new money also will be earmarked for hot spots in the Gulf Coast, Southwest, and Mid-Continent, and in regions like the Spraberry trend and deeper Devonian and Ellenburger areas of West Texas.

Newer spots such as the Williston Basin and additional areas in the Rocky Mountains and elsewhere will undergo aggressive exploration and development. One company, for example, said: "We have expanded our exploration activities during 1951 and expect to continue this expansion."

A company that is well representative of the industry told the Journal, "We propose to spend more money for exploration and the drilling of wells in 1952 than we ever have." Another said, "Approximately 60 per cent of our total expenditures forecast for 1952 will be for oil-field exploration and development of producing properties."

Refining.—The Journal's estimate for 1952 in this category is $800,000,000. A great deal of the projected refining and related manufacturing activity will be on projects allied to the defense program.

Transportation. — The Journal's estimate in this category for 1952 totals $660,000,000.

Marketing and other.—Estimated expenditures in this category, as presently budgeted for 1952, will total 240 million dollars.

Previous years.—The Journal's calculation that the petroleum industry will spend $3,900,000,000 in 1952, follows the growth trend of recent years.

The American Petroleum Institute has reported the bill was $3,000,000,000 in 1951, and capital expenditures in 1950 were $2,172,000,000 (the equivalent of $14.50 for every man, woman, and child in the nation). Of the 1950 total, $1,360,000,000 was spent in

The Journal's Report

OF CAPITAL EXPENDITURES FOR 1952

Industry division—	Millions of dollars
Producing (and Drilling)	2,200
Refining	800
Transportation	660
Marketing and other	240
Total, U. S. Oil Industry	3,900

Capital Expenditures by the Oil Industry

(1951 = $3,000,000,000. Previous years detailed below in millions of dollars; source, A.P.I.)

	Total company estimates 1950	Actual 1949	Actual 1946-49 inclusive	Yearly average 1946-49	Actual 1936-40 inclusive	Yearly average 1936-40
PRODUCTION:						
Crude oil—Leases, wells, equipment	$1,198	$1,270	$4,758	$1,190	$2,135	$427
Natural gas—Leases, wells, equipment	57	65	244	61	110	22
Natural-gasoline plants	74	104	264	66	78	15
Other, including crude and gas marketing	31	18	98	24	53	11
Total production	$1,360	$1,457	$5,364	$1,341	$2,376	$475
TRANSPORTATION:						
Pipe lines—Crude-oil lines	$ 120	$ 143	$ 547	$ 137	$ 180	$ 36
Products lines	74	31	166	41	49	10
Natural-gas lines	91	49	166	41	41	8
Marine	22	81	410	103	204	41
Tank cars	7	18	49	12	20	4
All other	10	10	59	15	12	2
Total transportation	$ 324	$ 332	$1,397	$ 349	$ 506	$101
REFINING	$ 394	$ 508	$1,827	$ 457	$ 617	$124
MARKETING	281	233	987	247	502	100
OTHER	41	62	196	49	82	17
Grand total	$2,400	$2,592	$9,771	$2,443	$4,083	$817
Facilities outside U. S. included in grand total	228	368	1,389	347	500	100
Total for domestic facilities	$2,172	$2,224	$8,382	$2,096	$3,583	$717

searching for and developing oil and gas reserves, while outlay for refining was $394,000,000, and transportation $324,000,000.

Of the $324,000,000 spent in transportation during 1950, the major portion was for pipe-line construction work, as follows: Crude oil lines $120,000,000 million, products lines $74,000,000, natural-gas lines $91,000,000.

The high mark and record of the United States oil industry prior to 1950 was the $2,300,000,000 capital expenditures made in 1948 (see table).

Counting in the investments the oil business will make this year, the industry's total for capital expenditures up to January 1, 1953, since the end of World War II, will approximate 19 billion dollars.

Area comment.—Here's what some of the oil companies told the Journal, in cases where they expressed information and data not specified as confidential and restricted for use in projecting United States totals:

West Coast.—"During 1951, due mainly to the most extensive exploration and field development program ever undertaken by our company and to substantial expenditures made towards the construction of a 28,500-bbl. daily fluid catalytic cracking plant and a 40,000-bbl. daily crude vacuum topping unit, the company established a new internal record of dollar capital expenditures of approximately $61,000,000, which exceeded the previous high year by about 50 per cent. In 1952, our company will aggressively continue its exploration and development program and even greater expenditures will be required to complete the construction of new refinery facilities.

"These factors, combined with necessary replacements and expansion in all divisions of the company, indicate that aggregate capital expenditures in 1952 will establish a new high record.

"As a comment on these expenditures, we wish to reemphasize a point that has been made repeatedly by industry in general. This is that it is becoming dangerously difficult for industry to obtain the funds necessary to finance even minimum expansion.

"On the one hand we are faced with price controls, and on the other hand with inadequate depletion and depreciation reserves in relation to replacement costs, with continuing uptrends in labor and material costs, and with punitive tax rates. In fact, we believe there is a serious question as to whether or not the profits, characterized as 'flush' or 'vast,' being reported today are actually sufficient to meet dividend payments and stay in business. It is entirely possible that if earning statements were adjusted to reflect current costs throughout, it might be demonstrated industry is liquidating rather than expanding its equity capital.

"There is one thing we can be sure of, to the extent depletion and depreciation reserves do not return equivalent purchasing power of capital initially invested, our government is actually levying a tax on capital, a part of which is misnomered as 'excess profits' tax."

Another company domiciled in the West advised the Journal that it anticipates a substantial increase in 1952 expenditures over last year, particularly in exploration and oil-field development.

Gulf Coast.—One company, headquartered in and operating extensively in this area, as well as the Southwest generally, summarized its outlook in this manner:

Activity—	1952 vs. 1951 Per cent
Exploration (other than drilling)	— 2
Drilling (exploratory and development)	+25
Producing (plant and equipment)	+ 1
Over-all budget	+10

Mid-Continent.—One company headquartered in this territory and with operations largely concentrated in the central and southwestern area reported to the Journal in this manner:

"We propose to spend more money for exploration and the drilling of wells in 1952 than we ever have. We have definite plans for stepping up our activity in states where we operate."

Over-all.—One of the largest integrated oil companies wired the Journal that its 1951 expenditures had been about one-third higher than that spent in 1950, and that it expects to make a further substantial increase in 1952.

Higher Octanes

Despite cut in TEL use, premium, regular gasoline have higher octane numbers than at end of third quarter 1951

BOTH premium and regular grades of gasoline now have higher octane numbers than at the end of the third quarter last year despite a reduction in the use of tetraethyl lead, according to the latest quarterly survey of the petroleum-chemical division of E. I. du Pont de Nemours & Co., Inc.

The unweighted average of premium octane numbers for the 45 cities, covered in both current and last year's report, was 90.0 at the first of January compared with 89.7 at the first of last October and 90.3 a year ago. The average octane number for premium gasoline is about 0.3 higher than in October but about 0.3 lower than for last January.

For the same cities, TEL content for premium averaged 1.75 cc. per gallon, down .19 cc. from October and .45 cc. from January 1951.

Numbers gain. — The tabulation by cities shows a gain in average octane numbers for premium in 37 cities since October.

Regular gasoline had an average octane number of 83.2, up 0.4 from October but down 0.5 from January last year.

Average TEL content per gallon for regular gasoline decreased to 1.35 cc. from 1.59 in October and 1.82 a year ago. Less tetraethyl lead is going into a gallon of premium gasoline now than was being used in regular gasoline last year.

GENERAL COMPARISONS*

	Jan. 1951	Oct. 1951	Jan. 1952
Premium:			
Research octane No.	90.3	89.7	90.0
TEL content (cc. per gallon)	2.20	1.94	1.75
Regular:			
Research octane No.	83.7	82.8	83.2
TEL content (cc. per gallon)	1.82	1.59	1.35

*Unweighted averages of figures for 45 cities.

COMPARISON OF MOTOR-GASOLINE SURVEYS

(Octane numbers are by research method; arithmetic averages by cities)

	Premium				Regular			
	Oct. No.			TEL content	Oct. No.			TEL content
	Jan. 1951	Oct. 1951	Jan. 1952	cc./gal. Jan. 1952	Jan. 1951	Oct. 1951	Jan. 1952	cc./gal. Jan. 1952
Aberdeen	89.3	88.4	88.3	2.16	78.2	81.4	81.8	1.25
Amarillo	88.3	87.5	88.0	2.06	77.2	80.3	80.4	1.58
Atlanta	92.3	91.3	91.3	1.37	81.1	84.1	84.7	1.19
Bakersfield	89.6	89.3	89.6	2.30	78.1	79.9	80.4	1.14
Baltimore	92.4	92.5	92.6	1.50	80.7	85.6	86.3	1.21
Boston	92.5	91.8	92.2	1.38	81.3	86.0	86.9	1.27
Calgary	83.7	84.5	85.9	2.66	76.0	78.5	79.3	1.66
Casper	89.3	88.2	89.0	1.13	76.8	80.6	81.0	0.72
Charlotte	92.4	91.6	91.5	1.68	81.3	84.5	85.3	1.57
Chicago	89.7	88.8	89.3	1.52	77.3	82.0	82.0	1.45
Cincinnati	90.6	90.8	91.1	2.04	80.0	85.2	86.0	1.62
Cleveland	91.0	90.8	91.0	1.90	79.5	85.2	86.4	1.19
Columbus, Ohio	91.6	90.7	91.5	1.98	80.0	85.5	86.4	1.39
Corpus Christi	92.3	91.0	90.6	1.61	80.0	83.5	83.2	1.62
Dallas—Fort Worth	92.1	91.3	91.6	2.16	77.7	84.1	83.9	1.67
Denver	89.0	88.2	88.3	1.24	76.7	80.6	81.0	1.11
Detroit	90.9	90.6	90.7	1.86	79.6	84.7	85.6	0.97
El Paso	87.2	85.7	85.6	2.65	75.5	77.2	77.7	1.44
Great Falls—Billings	90.6	90.0	90.0	1.68	76.0	81.3	82.0	1.28
Houston	92.7	91.4	91.6	1.94	79.9	84.4	84.4	1.87
Indianapolis	89.4	89.4	89.5	1.73	77.7	83.0	83.3	1.24
Jacksonville	91.9	91.0	91.4	1.41	80.9	84.9	85.4	1.55
Kansas City	90.7	88.5	89.0	1.30	78.6	82.1	82.3	1.05
Little Rock	90.6	90.5	90.4	1.93	79.8	84.0	83.4	1.85
Los Angeles	90.8	89.9	90.1	1.90	77.4	81.4	82.0	1.43
Louisville	91.4	90.1	90.4	2.02	80.2	83.5	84.1	2.16
Memphis	91.7	90.5	90.9	1.66	80.3	83.3	83.9	1.43
Milwaukee	89.3	89.3	89.6	1.70	77.3	82.4	82.9	1.25
Minneapolis	88.8	89.3	88.6	1.94	78.7	81.9	82.3	1.56
Montreal	89.3	89.5	89.9	1.50	80.0	84.7	84.7	1.20
Nashville	90.6	90.0	90.7	1.40	79.1	83.9	83.8	1.32
New Orleans	91.6	90.5	90.2	1.78	80.0	84.0	83.8	1.67
New York (Met. area)	92.2	91.7	92.2	1.62	80.9	85.8	86.4	1.21
Omaha	90.2	88.6	88.7	1.42	78.5	81.7	81.8	0.94
Philadelphia	92.6	91.1	91.8	1.36	80.1	86.1	86.5	1.37
Pittsburgh	92.1	91.6	92.0	1.82	80.7	85.8	86.2	1.71
St. Louis	90.4	88.8	89.0	1.51	78.3	82.4	82.4	1.19
Salt Lake City	90.7	88.4	88.9	0.83	75.2	78.2	79.7	0.55
San Francisco	91.0	90.2	90.4	1.91	77.3	81.2	81.8	0.87
Seattle	90.9	89.5	90.1	1.57	77.0	80.8	80.7	0.98
Shreveport	90.7	90.1	90.3	2.09	80.3	83.7	83.8	1.62
Spokane	90.3	89.4	89.2	1.40	78.3	81.2	81.6	1.02
Toronto	88.8	89.4	90.1	1.64	79.6	85.1	85.4	1.27
Tulsa	89.6	88.9	89.2	2.08	78.8	82.0	82.3	1.46
Vancouver		88.3	88.7	2.45		83.2	83.6	2.29
Wichita	87.6	86.8	87.2	2.44	77.3	80.4	80.8	1.81
Winnipeg		87.8	87.1	1.20		83.0	82.8	0.76

Catalytic Engines?

Cast-in catalyst approaches octane problem in new way

NEW YORK.—"Built-in octanes" in the form of a specially compounded collection of mineral catalysts cast into the combustion chamber, offer promise of improving the performance of future internal combustion engines, according to Associated Development & Research Corp. of New York.

In a carefully balanced combination, these catalysts tend to enhance the antiknock properties of gasoline and to prevent carbon deposition, said Robert S. Wallach, company president.

The development is a result of research conducted by Dr. Sophia Berkman, who is continuing experiments on this new approach to improvement of motor fuels. Natural ores and minerals selected for their individual catalytic activity, are compounded into a heterogeneous "synthetic" ore.

A small disk composed of these materials when cast in the cylinder head or piston of a motor promotes more complete combustion, according to Associated Development, and thereby reduces the need for higher-octane gasolines in engines of comparable compression ratios.

Some of the selected catalysts promote more complete combustion. Others are said to retard combustion rate and prevent knocking. Still others effect certain reactions of fuel components. The catalyst combination appears to be self-regenerating.

Test results. — At this preliminary stage in the development of the new process, some tests have been conducted with a Standard C.F.R. engine. Under standard testing conditions, Wallach stated that more than 60 gasoline samples had been run, with and without the cast-in catalyst. He reported these octane improvements on four representative fuels, in research octane numbers: (1) from 49 to 69; (2) from 55 to 80; (3) from 60 to 92; and (4) from 80 to 100. The maximum research octane number increase obtained through use of the catalyst was 32.

As regards compression ratio, Wal-

lach said, a representative gasoline giving a knockmeter reading of 50 at a compression ratio of 5.1/1 in an unaltered C.F.R. engine gave a comparable reading at a compression ratio of 8.7/1 in the same type of test engine equipped with the catalyst. These tests were conducted under standard conditions employing the same air-fuel ratio, temperature, etc.

Developers state that tests using the Berkman process have failed to produce any measurable carbon deposits after engines have been run for as long as 40 hours, illustrating another of the multiple reactions brought about by the combined catalysts.

Other uses?—The Berkman process, covered by patent application, has other potential uses, according to Wallach.

Among them is the prospect that the same synthetically compounded ores may eventually provide improved catalysts of greater stability for cracking petroleum fractions in refineries. The company states that revelation of its experimental work to date was made in an effort to apprise the automotive and petroleum industries of the possibilities involved with the development, and to invite testing and further research by interested companies.

Hydrate Headaches

Higher transmission-line pressures present engineers with increasingly tough gas hydrate-formation problem

Ted Armstrong

NORMAN, Okla. — Dehydration of gas to meet transmission-line requirements is becoming an increasing problem and is requiring more and more attention of operating companies.

This was the concensus of nearly 200 gas engineers attending the first gas-hydrate-control conference here January 18-19.

Gas pressures have been increased in order to move sufficient gas to meet greater national demands for the fuel, and the result has been an increasing threat of hydrate formation, accompanied by stepped-up efforts of operating engineers to meet the problem.

Triethylene glycol.—Most economical method of dehydrating well-head gas lies in the new triethylene glycol system, provided that recovery of liquid hydrocarbons is not a factor, John M. Campbell, of Black, Sivalls & Bryson, Inc., declared.

Compared with low-temperature separation, diethylene glycol injection, and dry desiccant systems, Campbell said, the triethylene system has a lower initial cost, operates with a lower drop in gas pressure, and has fewer controls thus requiring less attention. Equipment required is light and easy to move and in smaller installations may be skid-mounted. Liquid carry-over, he added, is less than a tenth of a gallon per million cubic feet of gas.

One disadvantage to date, he said, has been a foaming in the absorber, caused by condensation of light hydrocarbons, but this has been minimized by development of a defoaming agent. Another disadvantage, he said, is that the system operates at a maximum temperature of 100° F.

Methanol injection.—For a declining field, or a growing field in which ultimate capacity is not known, injection of methanol as an inhibitor may prove to be the most economical system, according to R. M. Woolfolk, Jr., of The California Co., Natchez, Miss.

Actual cost of the process is greater than most others, Woolfolk said, but its economy lies in providing dehydration of gas without a large capital investment when the ultimate need for gas processing is not known. When a new field is fully defined and its producing capacity known, it would be more economical to build a plant using a conventional process, he said.

Combination system.—Use of glycol injection at the well head in connection with a low-temperature separation system is expected to prove economical for Alantic Refining Co. in Mustang Island field, J. H. Sullivan, Dallas, told the engineers.

Injection at the well head, he said, protects the gathering system from hydrate formation. Further, Sullivan declared, the use of glycol in conjunction with the low-temperature separation process is expected to result in the recovery of as much as 40 per cent more liquid hydrocarbons than would normally be obtained.

Current studies, he said, indicate that the combined process is comparable in cost to the dry-desiccant type, but the economics are improved by the additional hydrocarbon recovery.

The glycol-injection system, he added, is applicable generally where there is a rapid decline in pressure between the well head and the processing unit; where initial pressure is not great enough to produce hydration by auto refrigeration; or where the wells are so scattered that heaters cannot be used or where they are not economically desirable.

The conference was arranged by the short-course division of the University of Oklahoma extension division.

AT HYDRATE CONFERENCE.—Participants in the short course on gas dehydration included this group. Left to right are Prof. L. S. Reid, chairman of the school of natural-gas engineering at the University of Oklahoma; R. M. Woolfolk, Jr., The California Co., Natchez, Miss.; T. S. Bacon, chief engineer of Lone Star Gas Co., Dallas; E. Paul Wilkinson, Magnolia Petroleum Co., Dallas; and W. M. Deaton, U. S. Bureau of Mines, Amarillo, Tex.

Oil Show Planned

I.P.E. executive committee favors exposition in 1953

TULSA. — The International Petroleum Exposition will be held in 1953 if equipment manufacturers now being polled go along with the recommendation of the I.P.E. executive committee.

Dates for the 1953 oil show have been set tentatively for May 14-23.

W. G. Skelly, exposition president, said a final decision on the proposed 1953 show will be announced after the executive committee contacts oil-equipment manufacturers.

The international exposition, originally scheduled for 1952, was postponed last year by the executive committee because of the stepped-up defense program. The exposition was last held in 1948, the silver anniversary of the beginning of the event.

Proposed dates for the next exposition indicate an increase of 2 days over the 8-day oil shows previously held. During the 1948 exposition there was a widely expressed opinion that the length of the show should be increased from 8 days to 10 days or 2 weeks.

The exposition once before was postponed because of war. No oil show was held between 1940 and the last exposition in 1948.

Industry Briefs

OIL CITY, Pa.—J. J. Jones, Bradford, Pa., told the board of directors of the Pennsylvania Grade Crude Oil Association last week that depressed crude prices have reduced the level of drilling operations and threaten to curb future crude production. Increased costs to the producer covering drilling, material, and labor were cited as factors contributing to the need for a higher crude price. Producers' associations, he said, must continue to work up facts and figures in support of a price boost for submission to the Office of Price Administration.

WASHINGTON. — The Office of Price Stabilization has increased ceiling prices on crude production from Mosser Dome field of Yellowstone County, Montana, and South Adams field of Arenac County, Michigan. The price of heavy crude from Mosser Dome was advanced 30 cents to $1.40 per barrel, and the new ceiling for South Adams oil is $2.75. Action was taken under CPR 32 which allows for adjustments in crude prices for individual fields to bring them in line with prices for the same quality of crude in the same general area.

WICHITA.—Kansas producers completed eight more oil wells last week than the week before, but new production dropped more than 11,000 bbl. daily. Total production potential of 18,309 bbl. daily was obtained during the week by 51 new completions. This compared with 43 producers and 29,415 bbl. daily for the preceding week.

ARDMORE, Okla.—Present crude-price restrictions will make it impossible for the petroleum industry to drill the necessary minimum of 50,000 wells this year, the executive committee of Independent Petroleum Association of America said here last week. These price controls, together with insufficient materials, threaten the loss of thousands of marginal producing properties and curtailment of necessary secondary-recovery operations, the committee said.

DENVER. — Montana's biggest oil and gas-lease auction brought in more than $3,315,428 for 226,000 state acres in two northeastern counties last week. The auctioned acreage lies between the C. H. Murphy Charles zone discovery well on the Fort Peck Indian Reservation and the Canadian border in northeastern Valley and northwestern Daniels counties. Nearest acreage to production is 50 miles northwest of the Murphy strike.

DENVER.—The Eleventh Regional Wage Stabilization Board last week set up representative wage rates for the contract oil-drilling industry in Colorado, Utah, Wyoming, and New Mexico. They will be used as guide rates in processing petitions. Hourly rates set were: Drillers, $2.31; motormen, $1.76; derrickmen, $1.76; helpers, roustabouts, and floormen, $1.65. The rates apply only to the independent oil-well contract-drilling industry, a board official said.

MONTREAL.—Shell Oil Co. of Canada has established a chemical division to handle the company's expanding activities in that field. The new organization will integrate the operation of the $500,000, 30-ton per day sulfur-recovery plant now building at Jumping Pound, Alta., and the $3,000,000 petrochemical plant at Montreal East, which is designed to produce about 1,500,000 gal. of isopropyl alcohol and 1,000,000 gal. of acetone annually.

GULF COAST

Alabama Strike

Humble success perks up interest near Florida line

BREWTON, Ala.—A discovery that will revive interest and may set off a play in southern Alabama and the Florida Panhandle has been indicated 6 miles west of here by Humble Oil & Refining Co.'s 1 A. W. Moye.

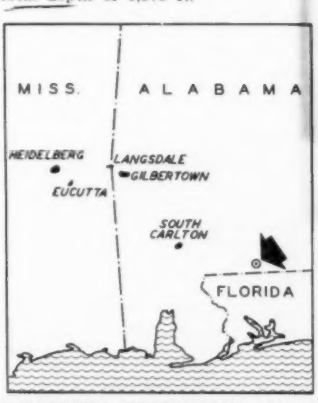
This probable discovery well flowed an ungaged volume of 29°-gravity oil on a 24-minute drill-stem test of the Upper Cretaceous-Tuscaloosa from 27 ft. of effective net pay in an interval in the neighborhood of 5,945 ft.

The wildcat is located just to the north of the Florida line in C NE NW 18-1n-9e, Escambia County, about 40 miles east of 14°-gravity production from the Tuscaloosa at South Carlton field.

Alabama's only other producing fields, Gilbertown, East Gilbertown, and a one-well extension of Mississippi's Langsdale field, produce 13° to 18°-gravity oil. East Gilbertown and Langsdale extension produce from the Cretaceous-Eutaw while Gilbertown, Alabama's biggest producer, has both Eutaw and Cretaceous-Selma chalk production.

First reports on the well indicated that it was producing at a rate of 1,000 bbl. daily. A company spokesman said, however, this report was premature. Humble is now setting 7-in. casing prior to running production tests which will determine if current excitement is justified.

Considerable interest was created in this area during the latter part of 1951 when Stanolind Oil & Gas Co. 1 F. A. Steward, 11-1n-8e, about 1½ miles northwest of Humble's well, recovered some 25°-gravity oil on a drill-stem test of the Tuscaloosa at 5,937-41 ft. Commercial production could not be developed, however, and the wildcat was completed dry at a total depth of 6,575 ft.



INDICATED DISCOVERY. — Sketch map shows the location of Humble Oil & Refining Co.'s probable discovery well in Escambia County, southern Alabama, just a few miles north of the Florida line. If completed as a commercial producer this wildcat will open Alabama's fourth and easternmost field.

SOUTHWEST

Spraberry Tests

Railroad Commission gives Sohio go-ahead on tests in effort to determine whether a well will drain 80 acres

MIDLAND.—Will an oil well in the Spraberry trend of West Texas drain 80 acres?

This question may be answered before long when Sohio Petroleum Co. gets its tests under way in Glasscock County. The Texas Railroad Commission has approved an experiment by the company on wells in Sections 1, 2, 11, and 14 of Block 37, T-5S, T&P Survey, to determine if a well will actually drain an 80-acre area.

This has long been an important question hanging over heads of Spraberry operators. In fact, at a number of hearings on the Spraberry producing problem over a period of months, *(The Oil and Gas Journal, October 4, 1951, page 150)*, the majority of engineers went on record as saying there was not sufficient evidence to prove that one well would drain 80 acres.

The commission authorized Sohio to shut in every other well in certain sections in order to determine if a well will drain equal to 80 acres. If interference occurs between wells, this will indicate production is coming from an equivalent area of at least 80 acres. However, if interference does not develop, then it should indicate that one well would not adequately drain the area.

Sohio's experiments will be conducted throughout the year. The company will submit data to the commission monthly, which will be made public by the commission in order that all operators may be informed of results.

Test rules.—The following limitations will apply during the tests:

1. No one lease will be permitted to produce more oil than it would be permitted to make under existing proration formulas.
2. No well will be permitted to make more than twice its normal allowable under existing proration.
3. A corner well on a lease shall not be permitted to produce more than its normal allowable.
4. Combined output from wells offsetting any lease will not exceed the combined normal allowable which the wells ordinarily would be permitted to produce.
5. Not more than half the wells on each of the leases may be closed down at any time during any part of the test period. Normal allowable of shut-in wells may be transferred to and produced from other wells on the same lease.
6. All tests on the four sections shall be reported to the commission monthly.
7. Wells receiving transfer of allowable from shut-in wells on the same lease must be producing with gas-oil ratio less than the limiting gas-oil ratio over which allowable of such well is penalized.

Spacing a problem. — Present spacing pattern in the vast Spraberry trend is 40 acres. At the meetings held last fall, a number of operators suggested 80-acre spacing in an effort to save steel. In fact, Petroleum Administration for Defense in Washington warned that it could not allocate enough steel to drill up the area on 40 acres. But opposition voiced by a number of operators and royalty and landowners caused any suggestion or recommendations of changing the present 40-acre spacing to be dropped.

A committee of operators' representatives had suggested wider spacing to make available supplies of steel spread over a larger part of the trend area. Generally, it would have allowed either 40 or 80-acre spacing of wells with allowable production being based on the basis of 50 per cent acreage and 50 per cent well on an 80-acre proration unit.

Wells already drilled on a 40-acre pattern, and wells offsetting those would be given an 80-acre allowable. This would have affected only the area south of the south line of Township 3 South in Midland and Glasscock counties *(The Oil and Gas Journal, October 18, 1951, page 72)*.

New Cementing Rule O.K.'d

AUSTIN.—In an effort to aid conservation of steel casing, the Texas Railroad Commission has issued a state-wide order permitting stage cementing of oil strings and setting of minimum amounts of surface casing in all fields, including those which have special surface-casing rules for protection of fresh-water strata.

The order will not, however, affect fields where special surface-casing rules have been adopted for reasons other than protection of water sands.

The new rule requires a multi-stage cementing job sufficient to protect all fresh-water sands. An earlier commission order had permitted multistage cementing and minimum surface casing in fields under state-wide Rule 12 (a).

Index Ready Soon

The complete editorial index of The Oil and Gas Journal for 1951 is now in preparation and will soon be ready. The complete index, enlarged and improved and with more cross-references, bound separately, will be sent to you without charge upon request. Address your request to Circulation Department, P. O. Box 1260, Tulsa.

MID-CONTINENT

Unit-Law Review

Supreme Court will study Oklahoma court's decision

WASHINGTON. — The Supreme Court has agreed to review a decision of the Oklahoma Supreme Court involving the constitutionality of the state's unitization law.

The case reached the high court on an appeal by Palmer Oil Corp., which challenged an order of the Oklahoma Corporation Commission requiring unitized management of an oil field in which it has a leasehold. *(The Oil and Gas Journal, March 22, 1951, page 68.)*

The Oklahoma law permits a majority of the lessees operating in an oil field to prevent or veto the entry of a unitization order, but such an order may be issued if the commission finds that unified management is reasonably necessary, will prevent waste, and "will result in the general advantage of the owners of the oil and gas rights."

Palmer's contention.—The company's case was based on contentions that the law provides for a discriminatory delegation of legislative and judicial powers, the methods used in defining the unit and determining the interests therein was unreasonable, arbitrary and unfair, and the act lacks due process and equal protection of the rights of royalty owners and impairs contractural rights.

The state court upheld the commission's order, ruling that the provision for permitting a majority of lessees to prevent or veto an order is not an unconstitutional delegation of legislative authority, the absence of a provision requiring the commission to find that unitization will result in more efficient use of a field's resources is not in violation of the Fourteenth Amendment, and the commission's order represented a legitimate exercise of the state's police powers.

WEST COAST

Growing Fields

Honor Rancho, Castaic Junction loom as best oil finds since Cuyama; Honor Rancho link with Castaic Hills seen

D. H. Stormont

LOS ANGELES. — Recent developments in Honor Rancho and Castaic Junction fields, 35 miles northwest of here, are showing both to be of substantial proportions. While not in the class of South Cuyama, they still are probably the most important new field discoveries in California since then.

Honor Rancho was discovered in August 1950 by the Texas Co. It now has seven oil producers completed in either the 4,300-ft. Rancho sand (Pliocene) or the 5,300-ft. Wayside sand (upper Miocene).

Castaic Junction, to date a Humble Oil & Refining Co. monopoly, has eight oil wells and one condensate producer. Discovered about 2 years ago, the field's four producing zones are between approximately 10,000 and 12,000 ft. deep and are in the Mohnian stage of upper Miocene.

Continuous pay?—Drilling, which had been proceeding along conservative lines, was given a decided boost earlier this month with completion of a link well in Section 36, midway between Honor Rancho and Castaic Hills fields.

The latter lies almost 2 miles northwest and was discovered last fall by Sterling et al. 1 Rynne. (See map.) The extensioner was Texas Co. 1 Honor Rancho-2 and was completed in the 5,900-ft. Sterling sand to indicate production might be continuous throughout the 2-mile trend.

Geologists familiar with the area place the Sterling sand below the Wayside and Rancho sands. In Honor Rancho only one test has been made below its two oil pays, and that was a 10,086-ft. dry hole south of existing production. Thus, the deeper Sterling sand also may be productive at Honor Rancho.

Because of the variable lithology and complex faulting, however, it is considered unlikely any one of the pays will be present throughout the 2-mile stretch.

Current activity. — Major companies which have entered the Castaic Hills-Honor Rancho activity recently include Continental Oil Co. and Richfield Oil Corp.

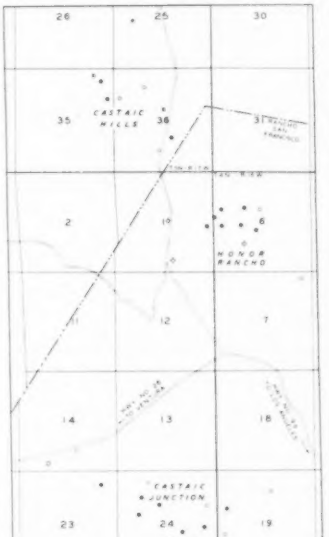
Continental, with a half interest in the extensive holdings of Sterling & Trousdale, as operator for the combine has two wells under way. Richfield recently completed its 1 Golden as a 1,000-ft. southeast extension to the Castaic Hills discovery and has started an east offset.

At Castaic Junction Humble has added a fourth producing zone with its 8 Newhall Land & Farming. Between 10,722 and 10,923 ft. the producer found 155 ft. of new oil sand capped by 55 ft. of net gas sand. A previous test, No. 6 N. L. & F., found 120 net feet of this sand but was carried deeper and completed in the field's 11,700-ft. sand. This pay may prove to be the field's best.

Until the new reservoir No. 15 was discovered, Humble had confined development to the 10,000-ft. reservoir No. 10, except for the discovery well in the deep reservoir (No. 21) and the gas-condensate well completed up-dip.

Five wells completed in No. 10 reservoir's Mohnian sand have found it to be productive for about 1 mile along the axis of the anticline. Net oil-stained sand and conglomerate encountered in these wells ranged from 95 ft. in No. 3 to 221 ft. in No. 4. A minimum oil column of 998 ft. has been proven.

How much farther down structure and down the flanks reservoir No. 10 will extend is yet to be proved by the drill. On the south side, where the dip is approximately 32°, its limit apparently has been defined by 2 Newhall Corp. which found the zone wet. On the north flank, however, the dip is much gentler so that Castaic Junction is expected to be wider than ¾-mile wide neighboring Newhall-Potrero.



HOT SPOTS.—This map shows producers, dry holes, and drilling wells in California fields currently holding top interest.

New Elk Hills Horizon

ELK HILLS, Calif.—A new producing zone, about 1,000 ft. deeper than any so far discovered in the reserve, has been established in the Navy's Elk Hills field.

Standard Oil Co. of California, unit operator for the shut-in field, completed the discovery well, X-55, at 9,309-50 ft. in the Carneros for 222 bbl. of 51.6°-gravity oil per day plus 1,519,000 cu. ft. of gas per day through a 10/64-in. choke.

The test was carried to a total depth of 12,856 ft.

CANADA

Field Crude Prices Cut

CALGARY, Alta. — Imperial Oil, Ltd., last week cut its purchase price 8.5 cents per barrel for crude from Golden Spike and Acheson fields and posted new prices of $2.40 and $2.6327 per barrel for crude from Joseph Lake and Wizard Lake fields, respectively.

Crude from these fields was shipped along with Leduc crude and priced on the same basis before completion of pipe-line outlets to Edmonton. New price for oil from Golden Spike and Acheson is $2.535.

Independent Hits First

CALGARY, Alta.—The first major discovery in Alberta this year has been credited to Scurry Oils, Ltd., a small independent, whose Scurry-Explorers 1 New Norway is flowing from D2 and D3 zones of the Devonian.

The discovery also claims the distinction of being the first made by a small independent firm in western Canada on land acquired by the company from land owners. No farmouts or participation with a major firm was involved.

The dual-zone strike, on LSD 16, 10-44-22w4, is located 120 miles northeast of Calgary and 4 miles southwest of Devonian oil wells at New Norway. It found about 111 ft. of D-2 zone and to date has penetrated 23 ft. of water-free oil-bearing D-3 zone. Coring and testing is continuing.

Budget Request

President asks 85.4 billion during fiscal year; most agencies dealing with oil, gas given bigger allocations

WASHINGTON.—The federal Government will spend $85,400,000,000 during the fiscal year which begins next July 1, an increase of $14,500,000,000 over the current year, but will have a revenue of only $71,000,000,000, an increase of only $8,300,000,000.

Because of a prospective deficit for the year of $14,400,000,000, President Truman told Congress in his annual budget message, the depletion allowance for oil and gas production and other "glaring injustices" in the tax laws should be eliminated.

As in recent past years, the emphasis throughout the budget was on defense and its concomitant activities—expansion of productive capacity, foreign aid, etc.—for which $65,100,000,000 is asked, an increase over this year of $15,400,000,000. But the President applied a very gentle economy axe to other government programs, cutting them $900,000,000 to $20,300,000,000.

Cost of the defense program—expansion of production, economic stabilization, and allocations—is put by the President at $900,000,000, but the figure is not broken down to show the individual amounts to go to the Petroleum Administration for Defense and other emergency agencies. The estimated expenditures of PAD this year, however, are $2,431,100.

Following the precedent established last year, estimates of revenue from numerous taxes, including those on gasoline and lubricating oils, were lumped in one general figure. Two taxes of interest to the industry, however, were reported separately. The 1953 revenue from transportation of oil by pipe line is estimated at $32,000,000, a $4,000,000 increase over the current year, and the new tax on diesel fuel used in highway vehicles is expected to return $6,000,000 during the 8 months of the current fiscal year that it will be in effect and $15,000,000 for the fiscal year 1953.

Royalties on minerals and other natural resources are expected to reach $43,412,000 in the 1953 year against $41,891,075 for the current year.

Interior's share.—Exclusive of funds for its defense agencies, the Department of the Interior is given a total of $686,044,500 in the 1953 budget, compared with estimated 1952 expenditures of $645,306,951.

The department would be given $187,000 for enforcement of the Connally Hot Oil Act against $169,670 this year to permit the addition of 5 employes to the staff of 27 now working.

The Bureau of Land Management is down to $10,750,000 against $9,722,605 this year, of which $490,000 against $427,060 would be for lease and disposal of mineral resources.

The Geological Survey is to be given $29,055,000, which includes $4,912,865 formerly appropriated to the Army, against $21,450,000 this year. From this fund, $6,525,000 is earmarked for geologic and mineral-resource surveys and mapping, against $5,822,000; $410,000 for classification of lands, against $360,000, and $1,110,000 for supervision of mining and oil and gas leases, against $936,000.

The budget explained that the increased funds for surveys and mapping will provide, among other things, for increasing investigations of mineral fuels with emphasis on potential oil-bearing regions.

The increased appropriation for supervision of leases will provide a operating staff about 50 per cent greater than in 1949 to handle a workload estimated to be 150 per cent greater. Currently the bureau is supervising some 57,000 lease properties, and since 1945 the royalties earned from those properties have increased from $12,500,000 to $40,000,000, it was explained.

Bureau of Mines.—The Bureau of Mines appropriation is jumped nearly $2,000,000, from $16,868,603 this year to $18,567,000 in 1953. The fund for petroleum and natural-gas investigations is increased to $1,365,310 from $1,318,910; $7,630,304 is provided for synthetic liquid-fuels development against $7,433,704, and $90,795 is set for helium research, the same as this year. Funds for construction include $250,000 for minor construction and alterations in synthetic-fuels laboratories and pilot-demonstration plants and $2,600,000 for the liquidation of the contract for the construction of the Morgantown, W. Va., station.

Synthetic rubber.—Capital expenditures of the Reconstruction Finance Corp. for synthetic-rubber production in 1953 are estimated at $20,000,000, part of which will be to increase cold-rubber output to 75 per cent of total production. Capital expenditures this year are estimated at $31,000,000 and will bring the annual production rate to 950,000 tons, which will be maintained throughout the 1953 fiscal year.

Expenses for operating the synthetic-rubber program are placed at $518,347,000 against $476,409,899 this year. The income from operations is estimated at $579,145,000 against $543,266,000, giving a profit before reserves and deduction of interest on investment of $62,408,000 against $73,276,000, and a net income, after such deductions, of $13,586,000 against $17,611,000.

Naval petroleum reserves.—The Defense Department is to be given $13,250,000 for operation of the naval petroleum reserves, against $11,948,000 this year, with $12,693,000 earmarked for Reserve No. 1 (Elk Hills, Calif.) against $11,493,000, and $400,000 for Reserve No. 3 (Teapot Dome, Wyo.), against $300,000.

The Elk Hills reserve is being developed at an accelerated rate to increase the potential capacity and place it as nearly as practicable in a state of instant readiness, it was explained. The drilling of several successful wildcat wells south of the Teapot Dome reserve, which has been shut in since 1928, has resulted in a decision to test the deeper zones. One exploratory well is being drilled this year.

The department is going ahead with its exploratory work in Reserve No. 4 in Alaska, and has asked for $8,500,000, of which $7,600,000 will go for exploration, $650,000 for the airlift of supplies and $250,000 for airway facilities. *(See Special Report.)*

Among other agencies whose activities are of some interest to the oil and gas industry, the National Security Resources Board is to get $1,780,000 against $1,600,000 this year; $4,540,000 is asked for the Federal Power Commission, against $3,802,325, of which $1,739,000, against $1,582,000, would go for regulation and surveys of the natural-gas industry; $4,367,000 is sought for the Federal Trade Commission, against $4,040,400, and the Interstate Commerce Commission would get $9,975,000 against $8,784,935, of which $493,484 would be for its valuation of railroads and pipe lines compared with $484,966 this year.

The budget provides $3,750,000 for the antitrust division of the Department of Justice, against $3,200,000 for this year; and the Tariff Commission is down for $1,388,000 against $1,163,600.

Fast Tax Write-Offs O.K.'d

WASHINGTON. — More than $1,000,000,000 in new facilities in and of interest to the oil and gas industry has been granted certificates of accel-

WATCHING WASHINGTON

Bertram F. Linz

Only 27 Years to Go

The same have-not philosophy that prompted forecasts over the years that we were running out of oil has now seized upon natural gas as the subject for similar dire predictions.

The natural-gas prediction is that unless large new sources are found supplies may be exhausted in a generation.

The oracle in this instance was not a government official or geologist, but an officer of a city gas company. On the basis of present reserves and rate of use he gave the natural-gas industry 27 years to get out of business.

This pessimistic projection, of course, was used as an argument for an increase in consumer rates, but it is more than a little reminiscent of the predictions made over the past half-century regarding our domestic oil supplies.

The company official admitted, however, that scientific and engineering skill may solve the problem of disappearing gas reserves, a concession for which the industry will be profoundly grateful.

Oil Law Killed?

A recent decree of President Vargas of Brazil appears to have killed all chance of enactment of any law that would permit American oil companies to develop the petroleum resources of the country.

The decree alters retroactively the basis for the remittance of profits and dividends to the home countries of foreign companies. Reportedly, it was promulgated without the knowledge of officials of the Bank of Brazil or the ministry of finance.

State Department officials are discussing the decree with the Brazilian Government and hope to secure its modification, but until something is accomplished it is not believed there is any chance of bringing up the proposed revision of the Brazilian mineral law.

Under the mineral law, no foreign capital is permitted to enter into the exploration for and development of oil.

OAP Next in Line

A thorough investigation of the activities of the Office of Alien Property in managing and disposing of some $509,000,000 of assets seized from enemy aliens during the last war is being readied in the Senate.

The OAP already has disposed of $210,000,000 of vested assets and still has control of $298,000,000 worth and a bipartisan group of senators want a judiciary subcommittee to look into the management of these assets and their disposition.

A report on active business enterprises in which there is a substantial vested interest discloses that 38 concerns are still being managed by the OAP, 2 of them in the oil industry.

The oil companies are Amerlagene, Inc., of Shreveport, La., 100 per cent vested; and Spur Distributing Co., Inc., Nashville, Tenn., 55.3 per cent vested.

Amerlagene is engaged in the operation of oil wells and at the close of the last fiscal year had total assets of $59,193 and a net worth of $54,699. Spur operates a string of gasoline stations and at the end of 1950 had total assets of $5,734,386 and a net worth of $3,560,954, the OAP reported.

Powerful Peanut!

You can run a tractor on peanut oil as well as on diesel fuel, but not so cheaply.

Peanut oil was one of a number of substitutes for petroleum suggested in the Far East last year when the closing down of Iranian production threatened the supply of petroleum. So far as has been reported to Washington, however, no substitute was found comparable to petroleum in both quality and economy.

The fuel possibilities of the peanut were developed in a 50-hour working test with a 54-hp. track-type tractor in India. As recently reported to the Department of Agriculture in Washington, refined peanut oil caused no trouble in starting; engine performance was as smooth and normal as with high-speed diesel oil; smokiness became perceptible toward the end of the test; consumption in the later stages of the runs was slightly more than in the earlier stages, both on load and no load; there was no noticeable decrease in power output in changing from the use of diesel, and peanut oil caused no undue deposit of carbon or resulted in evidence of burning, pittings, or corrosion of valves or valve seats.

There was only one drawback to the use of peanut oil—it cost about eight times as much as diesel fuel.

erated amortization by the Defense Production Administration.

A summary of certificates up to the close of November shows that 254 projects to cost more than $989,000,000 had been granted certificates, but during December that figure was increased by more than $100,000,000.

The majority of applications covered oil-refining facilities, with 148 projects to cost $872,145,000 on which quick write-off was allowed on $575,393,000 or an average of 66 per cent.

There were 32 projects for natural-gasoline facilities approved up to November 30, involving an investment of $73,719,000 on which amortization was allowed on $40,560,000, or 55 per cent; eight sulfur projects costing $8,893,000 on which quick amortization was allowed for $7,188,000, or 80.8 per cent; five synthetic-rubber projects to cost $11,680,000, given amortization on $7,771,000 or 66.5 per cent; four projects for oil-field machinery and tools to cost $566,000, given $383,000 or 67.7 per cent; one crude pipe line to cost $1,000,000 given $800,000, or 80 per cent; one products pipe line to cost $79,000, given $30,000, or 38 per cent; five natural-gas-transmission lines to cost $3,512,000, given $1,428,000 or 40.7 per cent; and 50 projects for oil storage and distribution to cost $17,860,000, given $10,631,000 or 59.4 per cent.

Tidelands Try

Interim-operation bill sent to floor of Senate

WASHINGTON. — The long-stymied tidelands legislation has finally been sent to the Senate floor by an Interior affairs committee, none of whose members is formally committed to its support.

With only two members dissenting, the 13-man committee voted to report a compromise measure based on Sen. Joseph C. O'Mahoney's resolution for interim federal management of tidelands oil resources and some of the amendatory suggestions made last year by Sen. Russell B. Long of Louisiana.

Interior and Justice Department officials consulted on the matter were said to have raised no objections although, on the other hand, they did not give their approval to the terms of the compromise.

The compromise still is only stopgap legislation, designed to run for 5 years or until Congress earlier passes a permanent measure either giving the Interior Department jurisdiction over the tidelands or returning them to state ownership.

During that period, the Secretary of the Interior may issue leases for oil and gas development, but leases on lands within the 3-mile limit will be subject to state approval. Leases from the state seaward boundaries to

the edge of the Continental Shelf, an area to which the states have never claimed title, remain under federal jurisdiction solely.

Provisions. — The measure provides that the states are to receive 37½ per cent of lease revenues immediately and the remainder is to be put into escrow awaiting final settlement of the controversy. The committee voted down a proposal which would have earmarked the federal revenue, half for retirement of the public debt and half for federal aid to education.

Under the bill, legally-issued state leases now outstanding on the tidelands would be recognized by the federal Government.

Two committee members were absent when the vote was taken, Sens. Ernest W. McFarland of Arizona and Arthur V. Watkins of Utah. The two who voted against the measure were James E. Murray of Montana and George W. Malone of Nevada.

It was emphasized that none of the members of the committee were committed to support of the measure when it comes up on the floor, or precluded from offering amendments. The whole purpose of the committee's action, it was explained, was to get the legislation on the floor so that the Senate could vote on it.

Substitute possible.—When the measure does come up it will be possible to move to substitute the bill restoring title to the states, which the House passed last year, and it is expected that will be done. The issue then will be defined as state vs. federal ownership and management of tidelands oil.

It was also pointed out that the bill does not in any way prejudice the final settlement of the Supreme Court decisions awarding the California, Texas, and Louisiana tidelands to the federal Government.

Export Data Available

WASHINGTON.—Issuance of weekly reports on exports of major petroleum products has been resumed by the Petroleum Administration for Defense after having been suspended for several weeks while the security aspects of the publication of the figures was under study.

The reports cover exports by tanker and barge movement only, except for aviation gasoline for which all methods of transportation are included.

Within these limitations, PAD reported that during the week ended December 28 aviation-gasoline exports averaged 43,000 bbl. daily against 35,100 bbl. daily in the preceding week; motor-gasoline exports averaged 61,800 bbl. daily against 42,300 bbl.; kerosine, 900 bbl. against 12,000 bbl.; distillate, 42,600 bbl. against 28,500 bbl.; and residual, 71,600 bbl. against 46,900 bbl.

Total exports during the week averaged 219,900 bbl. daily against daily averages of 164,800 bbl. for the week ended December 21; 263,500 bbl. for the week ended December 14, and 271,300 bbl. for the week ended December 7.

NPC Meeting This Week

WASHINGTON.—The National Petroleum Council will hold its first 1952 meeting this week, with organizational matters scheduled to be the first subject of business.

Topping the actions to be taken by the council are the election of a chairman and adoption of a budget for the coming year. Chairman of the various committees having assignments from the Interior Department are expected to report on the status of their investigations.

A number of highly important studies are now under way and additional inquiries may be requested by the department at this week's meeting. Among the matters under investigation are oil and gas availability, costs of synthetic liquid fuels, petroleum truck transportation, underground storage, and patterns in the need of oil and gas producers for tubular goods by sizes, weights, and grades.

Considerable discussion of synthetic liquid fuels may develop following the expected submission of a supplementary report on the cost of producing gasoline from coal on which a committee has been working since it presented its first report to the council last October.

Control Orders Set Up

WASHINGTON.—The following orders have been issued by the National Production Authority:

Direction 4 to CMP Reg. 6, January 17: Requiring water-well drilling contractors to apply quarterly for allotments of controlled materials.

Amendment to M-26, January 17: Reducing the use of aluminum closures for the packaging of certain chemicals and other liquids.

M-92, January 17: Restricting the use of spinning grades of chrysotile asbestos fiber used for automobile brake linings, oil-burner wicks, etc.

Direction 1 to M-6A, January 21: Requiring steel distributors to give preferential treatment to machine-tool builders', military, and atomic-energy orders which can be filled from warehouse inventories.

Washington Briefs

Sen. Joseph C. O'Mahoney of Wyoming has asked the Senate to grant a 1-year extension for the all-fuels investigation started by the Interior Affairs Committee in 1950. So far, the only visible result of the committee's work has been the round-table discussion last year. It was proposed to hold field hearings, but this idea has been dropped, apparently, and about all that is now expected is the calling of spokesmen for the various government agencies concerned with fuel matters to get their ideas and suggestions.

Appointment of David H. West, Red Bank, N. J., as assistant director of the foreign-supply and transportation division of the Petroleum Administration for Defense was announced last week by Deputy Administrator Bruce K. Brown. West was connected with Standard Oil Co. (N. J.) for 21 years, resigning in 1949 because of ill health. He joined PAD last October as chief of the distribution branch of the supply and transportation division after serving for 4 months as chief of the fuel and chemicals branch in the Trenton, N. J., office of the Office of Price Stabilization.

Lloyd Holsapple, division engineer with Sinclair Oil & Gas Co., has been granted leave of absence to serve for 6 months as assistant chief of the drilling, production, and materials branch of the Petroleum Administration for Defense. Holsapple was attached to Sinclair's general production department and handled engineering phases of proration and other matters before the Texas Railroad Commission.

EASTERN

T.G.T. Seeks Rehearing

WASHINGTON. — Tennessee Gas Transmission Corp. has asked the Federal Power Commission to reopen proceedings for its proposal to build a pipe line from Hebron field in Potter County, Pennsylvania, to T.G.T.'s main line at Utica, N. Y.

Proceedings culminated last summer in issuance of a certificate for construction of facilities which the company refused to accept because of denial of the proposed line.

The rejected certificate would have permitted an increase in the company's delivery capacity from 1,310,000 M.c.f. daily to 1,395,000 M.c.f., but in its new application the company proposes to increase its capacity to 1,515,000 M.c.f. daily.

The project now proposed would call for the construction of about 591 miles of parallel loop along the company's existing system; approximately 304 miles of 24-in. line from the Mercer area to Utica; about 137,000 hp. in new stations, and approximately 250 miles of miscellaneous lateral lines at an over-all cost of approximately $128,216,000. The estimated cost under the original program was $94,869,000.

The company also asked the FPC

to reissue a certificate authorizing facilities necessary to develop and utilize an underground-storage area in Hebron field for natural gas. The project was authorized last June but the certificate lapsed because of Tennessee's failure to accept it in writing within 30 days.

Gas-Production Plan

New Oriskany field would be produced only during winter; pressures, spacing would determine each well's allowable

MARIETTA, Ohio.—Ben H. Putnam, Marietta, discoverer of the new 4,100-4,200-ft. Oriskany gas pool lying just west of both this city and Parkersburg, W. Va., has had prepared a specially engineered "operational plan" to meet conditions there.

Purpose of the plan is to schedule development and production so as to conserve gas for winter use as needed. The plan visualizes greater recovery of both gas and condensate by withdrawal under controlled pressures.

Considerable recovery of condensate, to be marketed as a byproduct, is expected under reasonable gas-withdrawal rates. The operational plan was designed by Keplinger & Wanenmacher, Tulsa consulting petroleum engineers. It calls for 160-acre well-spacing units, or greater where possible.

The new Oriskany pool lies in the center of an area where there already are several large gas-storage reservoirs now storing more than 125 billion cubic feet for winter use. If the pool should develop to the size now indicated, it would about double the local gas supply.

Putnam discovery.—Ben F. Putnam & Associates opened the new pool with 1 Wilson last year, in Athens County, Ohio. The well gaged 2.3 million cubic feet daily at 4,222 ft., total depth, but was plugged due to mechanical troubles in completing. The offset, Putnam 2 Wilson *(see map)* was completed for 5.5 million cubic feet daily initial open flow after shooting with 80 qt.; shut-in pressure after 24 hours was 1,675 psig. The third Putnam et al well, 1 Lamp, in Washington County, Ohio, initialed 6.2 million cubic feet daily following a 90-qt. shot; shut-in pressure after 48 hours was 1,670 psig.

About 18 miles north-northeast of these wells, Putnam 1 Arnold is showing for 650 M.c.f. daily after drilling only 1 ft. into the Oriskany.

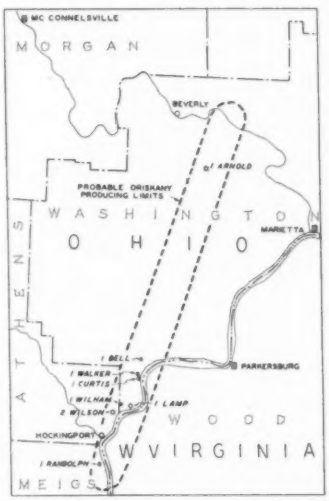
Withdrawal plan. — Gas production would be allocated under the plan on the basis of (1) 160 days of delivery from each well, and (2) delivery from each well at a constant back pressure or line pressure. This would apply to all wells drilled on 160-acre units.

In those cases where 160-acre units are impossible, the allowable would be on the basis of 1 day of take per acre in the unit. For example, if the unit contained only 140 acres, total yearly take from each well would be for 140 days.

Gas from the reservoir will be purchased by Ohio Fuel Gas Co. and Hope Natural Gas Co. These purchasers would gather the gas at the well head and provide a market for everyone owning gas wells in the reservoir. Under the proposed plan, gas-purchasing companies would reserve 40 per cent of the gas production from the reservoir for gas consumption in the Marietta-Parkersburg area.

Drilling.—These Oriskany wells are being drilled with cable tools. Normal drilling and completion time requires about 60 days. Drilling prices are running $4.00 to $4.25 per foot.

Reserves. — The new Putnam - Oriskany pool is by no means the first Oriskany gas in Ohio, West Virginia, Pennsylvania, or New York *(see "Exploration and Drilling," The Oil and Gas Journal, January 21, 1952, page 143)*. At this time, Oriskany sand thickness and core data for the Putnam area are not sufficient to permit exact gas-reserve computations. However, the old Cambridge, Ohio, Oriskany area north of the new pool has recovered between 3 to 4 million cubic feet per acre. To the south, in western West Virginia, the Oriskany pools between Charleston and Limestone Hill have recovered between 5 to 6 million cubic feet per acre.



NEW FIELD. — Map showing new Oriskany sand gas-well completions (4,100-4,200 ft.) in Ohio and West Virginia. The area lies west of Marietta, Ohio, and Parkersburg, W. Va. Production has been found in Athens and Washington counties, Ohio, and will probably extend into Morgan and Meigs counties, Ohio, and Wood County, West Virginia.

ROCKY MOUNTAIN

Dakota Spacing Rule Awaited

BISMARCK, N. D. — Hearings on Amerada Petroleum Corp.'s application for a change to 80-acre spacing for the new Beaver Lodge Madison lime oil field in North Dakota were concluded here last week by the state industrial commission.

The commission, after hearing testimony both for and against the switch from the 40-acre pattern during the 4-day hearing, is expected to announce its decision in about 30 days.

Opposition arguments were principally that the application is premature due to lack of production history, that one well to 80 acres will not drain the acreage effectively, that the change would slow exploration, and that it would cut tax revenue.

Consulting engineers and geologists supporting Amerada's application testified that field tests indicate that the Madison lime would give up its oil satisfactorily with the wider spacing. Production in the Madison, they said, is by water drive, and both permeability and porosity tests are favorable.

Amerada asked the commission for a 200 bbl. per day allowable for the discovery well and for other producers as they are completed.

Rangely Gas Output Limited

DENVER.—Alarmed over the apparent waste of residue gas from Rangely field—the state's largest oil-producing area—the Colorado Oil and Gas Conservation Commission has ordered gas production limitations and set gas-oil ratios on wells in the field.

The commission also ordered operators to work out by February 15 a plan to prevent waste of oil and gas in the field, including measures to inject residue gas into the Weber formation. *(The Oil and Gas Journal, December 6, 1951, page 70)*.

Any well that produces gas in excess of 1,000 cu. ft. per barrel of oil, and any well that produces more than 150,000 cu. ft. of gas daily might cause waste and should be restricted, the commission ruled. It also held that production of gas from the free gas-cap area of Weber sand pool is "waste of reservoir energy" and flaring of about 20,000,000 cu. ft. of residue gas daily "constitutes waste."

World Production Drops

Foreign output gained in November, but U. S. decrease lowered average 26,000 bbl. to 11,594,000 bbl. daily

Dahl M. Duff

FOREIGN production of crude oil in November showed another encouraging increase but was still nearly 180,000 bbl. daily below the record high production of last May when the Iranian industry was going full blast.

In November, the daily average for all foreign areas outside the United States and excluding the Communist-dominated countries, was approximately 4,699,000 bbl. This compares with 4,585,600 bbl. daily in October and 4,878,400 bbl. daily last May.

Despite the gain in foreign output from October to November, total world production fell back slightly due to a sharp decline in the United States. World production in November amounted to 11,954,000 bbl. daily, down about 26,000 bbl. daily from the previous month.

The drop in crude output in the United States was nearly 140,000 bbl. daily. Domestic production in November averaged 6,235,000 bbl. daily, compared to the record high of 6,374,500 bbl. daily reached the previous month.

Disregarding these month-to-month changes, however, production both in the United States and abroad continues well above that of a year ago. Non-Communist foreign production in November was 6.6 per cent above that for November 1950. United States output in the same month was 5.8 per cent above the 1950 period.

Russian output.—Crude production of Russia and its eastern European satellites now appears to be exceeding 1,000,000 bbl. daily. The Russian Government publication, Izvestia, announced recently that 1951 Soviet output gained 4,500,000 tons or about 90,000 bbl. daily over 1950. This indicates an output last year averaging 842,000 bbl. daily, and provides the basis for the estimate of about 860,000 bbl. daily in November.

Romania is believed to be producing about 89,000 bbl. daily, a figure which agrees with generally accepted industry estimates but which is considerably below some Russian claims. Somewhat better information credits an output of 41,000 bbl. daily to the Russian Zone in Austria. The total for Soviet Russia and the Communist eastern European areas is nearly 1,020,000 bbl. daily.

Western Hemisphere.—The most abrupt change in the production report for the foreign areas of the Western Hemisphere was the decline in Canada. This drop had been expected since Alberta's output depends partially on the Interprovincial pipe line and seasonal shipments on the Great Lakes. Canadian production fell off 18,700 bbl. daily in November.

Another decrease was in Colombia where production was down about

WORLD CRUDE-OIL PRODUCTION
(In thousands of barrels daily)

Country—	Nov. 1951	Oct. 1951	Nov. 1950
Western Hemisphere:			
Argentina	70.0	72.0	65.8
Bolivia	1.6	1.5	1.8
Brazil	2.4	2.5	1.4
Canada	137.0	155.7	104.7
Chile	2.1	2.1	1.7
Colombia	96.1	106.2	99.0
Cuba	0.1	0.1	0.2
Ecuador	8.2	8.2	7.3
Mexico	210.0	213.0	204.0
Peru	45.0	44.5	42.9
Trinidad	57.7	57.7	57.1
Venezuela	1,754.2	1,732.1	1,611.7
Total	2,384.4	2,395.6	2,197.6
Europe and Africa:			
France	6.5	6.1	3.3
French Morocco	1.9	1.9	0.9
Germany	29.2	28.9	23.1
Italy	0.5	0.5	0.2
Netherlands	13.7	13.3	12.6
Egypt	46.1	44.3	45.6
United Kingdom	1.0	0.9	0.9
Total	98.9	95.9	86.6
Middle East:			
Bahrein	30.2	30.2	29.7
Iran	75.0		657.4
Iraq	175.0	176.2	156.2
Kuwait	705.1	707.6	396.7
Qatar	50.0	46.0	38.6
Saudi Arabia	896.7	848.1	620.1
Turkey	0.5	0.5	0.8
Total	1,932.5	1,810.6	1,899.5

Country—	Nov. 1951	Oct. 1951	Nov. 1950
Other Asia:			
British Borneo	105.0	105.0	93.2
Burma	2.0	2.0	2.0
China	2.2	2.2	2.0
India	5.0	5.0	5.0
Indonesia	155.0	155.0	110.0
Japan	6.0	6.1	6.1
New Guinea	4.9	4.9	4.8
Pakistan	3.3	3.3	3.5
Total	283.4	283.5	226.6
Total foreign less Russia and E. Europe	4,699.2	4,585.6	4,410.3
Estimated Russia and Eastern Europe:			
Austria	41.0	41.0	30.0
Romania	89.0	89.0	85.0
Russia	860.0	860.0	775.0
Other E. Europe	29.8	29.8	24.1
Total	1,019.8	1,019.8	914.1
Total foreign	5,719.0	5,605.4	5,324.4
United States	6,235.0	6,374.5	5,890.8
World total	11,954.0	11,979.9	11,215.2

Figures are from reliable reports in the industry or official government sources. Data for Russia and Eastern Europe are based on competent estimates; no authentic information is available on month-to-month production in these areas. Completely current reports also are lacking for certain countries of Southeast Asia. Data for earlier months have been revised where necessary.

10,000 bbl. daily to a daily average of 96,100 bbl., excluding condensate. The decline was in the Barco concession, down about 5,400 bbl. daily, and in Yondo, down about 4,000 bbl. daily. November production in Colombia, by concessions, was: De Mares (government company), 36,220 bbl. daily; Barco, 23,761 bbl. daily; Yondo, 31,828 bbl. daily; Cantagallo, 1,290 bbl. daily; Dificil, 1,714 bbl. daily; and Velasquez, 1,261 bbl. daily.

Venezuelan production set another record in November, rising 22,100 bbl. daily to 1,754,200 bbl. daily. Through 1951, only in August has Venezuelan production failed to establish a new high. Weekly production figures for Venezuela in November were: Week ended November 5, 1,735,500 bbl. daily; November 12, 1,752,600 bbl. daily; November 19, 1,762,300 bbl. daily, and November 26, 1,745,500 bbl. daily.

VENEZUELAN PRODUCTION

(Industry figures on production by companies, including royalty and other purchases, in the week ended November 26.)

Creole	774,481
Shell	557,657
Mene Grande Group	260,780
Socony-Vacuum	53,809
Texas-Mercedes	46,069
Atlantic	11,261
Sinclair	9,009
Pantepec	8,724
Richmond	7,650
Phillips	7,368
Pancoastal	6,127
American Maracaibo	1,124
B.C.O.	920
Venezuela Government	543
Total	1,745,512

Europe.—Western Germany's production in November maintained the slowly rising trend that has characterized operations in this country the last several years. November's average of 29,200 bbl. daily was equivalent to 124,147 metric tons. By districts, production was, in tons: Emsland, 55,156; Hannover, 59,250; Schleswig - Holstein - Hamburg, 9,235; and Baden, 506.

Italian production has shown slight gains in recent months. This may be the beginning of rising output in this country as a result of the limited exploratory success of the Italian Government company insofar as crude oil, as distinct from natural gas and condensate, is concerned.

Egyptian production continues with little change. The month's total consisted of about 683,000 bbl. from Sinai fields, and about 701,000 bbl. from the two areas west of the Gulf of Suez.

Middle East.—In the Middle East, the most outstanding change was the increase in production in Saudi Arabia to a new record of 896,700 bbl. daily, a gain of 48,600 bbl. daily, or 5.7 per cent over the previous month. Kuwait's production was little changed at about 705,000 bbl. daily.

Although the exact level of production in Iran is not known since Anglo-Iranian Oil Co., Ltd., evacuated personnel from its concession, the reported rate of operation of the Abadan refinery indicates a crude output by National Iranian Oil Co. during November of approximately 75,000 bbl. daily.

November 2, N.I.O.C. started one distillation unit and kept it running until the early part of December when storage was again filled. On November 10, this unit was reported processing 11,400 tons daily of Agha Jari crude. Between November 2 and 12, it ran 2,569,600 gal., or about 73,500 bbl. daily.

TREND OVER LAST YEAR

	W. Hemisphere less U. S.	Middle East	Total foreign less Russia and E. Europe
1950—December	2,213.6	1,988.9	4,563.0
1951—			
January	2,210.9	1,874.2	4,450.9
February	2,220.3	1,947.4	4,536.8
March	2,254.1	1,961.1	4,581.1
April	2,261.5	2,013.4	4,632.1
May	2,314.0	2,203.8	4,878.4
June	2,335.5	2,172.4	4,877.8
July	2,374.5	1,835.5	4,579.0
August	2,388.0	1,789.7	4,555.3
September	2,396.3	1,741.7	4,517.6
October	2,395.6	1,810.6	4,585.6
November	2,384.4	1,932.5	4,699.2

MIDDLE EAST

Aramco Shift

Top management will transfer to Saudi Arabia as move toward closer relationship between company, country

ARABIAN AMERICAN OIL CO.'s decision to transfer its top management to Saudi Arabia is in line with the current trend in foreign oil operations.

Announcing last week the resignation of W. F. Moore as president because of ill health, Aramco said that his successor would reside in Saudi Arabia rather than in New York. F. A. Davies, new Aramco board chairman and now chief executive officer, also will live in Saudi Arabia. *(See personality sketch in Personals section).*

Although the company will continue to maintain its New York offices which now have 700 employes the move of the top executive officers will make Dhahran the principal executive headquarters of the company. It is expected that Moore's successor will be elected in the near future.

Shifting the management of foreign oil companies to the countries in which they operate is a part of the general effort to identify the companies with the local interest. Creole Petroleum Corp. (Standard Oil Co. [N. J.]), has long maintained nearly all of its management in Caracas. Anglo-Egyptian Oilfields, Ltd., last year transferred its main executive offices to Cairo at the insistence of the Egyptian Government. A similar move has been under discussion at various times for Iraq Petroleum Co., Ltd.

Foreign operating companies have become increasingly cognizant in the last few years of the desirability of integrating themselves more closely with the countries concerned. The 50-50 partnership agreements are a development in the same trend.

In the case of management location, the local governments have in some cases in the past complained that they are forced to deal in their own countries with second-level officials of a company. Field location of the management avoids a feeling that the company is controlled from a remote location in New York or London.

Announced by Rodgers.—The transfer of Aramco's operating headquarters to Dhahran was announced by W. S. S. Rodgers, board chairman of The Texas Co., who also has been Aramco chairman. Rodgers pointed out that nearly 24,000 of Aramco's 24,500 employes are now stationed in Saudi Arabia. There are about 2,600 American employes of Aramco in Saudi Arabia and an additional 2,000 wives and children.

"Shifting of additional personnel to Saudi Arabia to support the increased emphasis on the concentration of top management there will be worked out over the next several months," Rodgers said. "However, since there are only some 700 Aramco employes in the United States and many of them will be required to carry on the work here, no major migration is expected."

Rodgers will continue as a director, although he will be succeeded as board chairman by Davies, who will devote his full time to this position as chief executive officer of the company. Davies has been executive vice president of the company since 1949.

It also was annouced that Floyd W. Ohliger, vice president in charge of government and concession affairs in Saudi Arabia, has been elected to board membership. Other members of Aramco's board consist of officials of its four parent companies, Standard Oil Co. of California, The Texas Co., Standard Oil Co. (N. J.), and Socony-Vacuum Oil Co., Inc.

Located first producer.—Davies has been identified with oil operations in the Persian Gulf since 1930. He located the first producing well in Bahrein for Standard of California, the

original sole holder of the Bahrein and later the Arabian concession. He was president of California Arabian Standard Oil Co., Aramco's predecessor. He took personal charge of exploration and production in Saudi Arabia for Aramco, was made executive vice president in 1949 and director last year.

Moore, the retiring president, became Aramco's head in 1947 after serving 2 years as general manager of The Texas Co.'s foreign-operations department. He joined The Texas Co. at the Port Arthur, Tex., refinery in 1920 and had a long career in both domestic and foreign operations with The Texas Co. before joining Aramco.

Ohliger worked in Venezuela, Colomia, and various parts of the United States before going to Saudi Arabia in 1935. He was general manager there for Aramco before being elected a vice president in 1947.

New Offer Made

Britain, under informally suggested plan, would buy 500,000 bbl. daily of Iranian crude at $1.10 per barrel

A LONG-TERM agreement under which Iran would sell Britain about 500,000 bbl. of oil daily, presumably crude, at $1.10 a barrel has been informally advanced as one of three alternative plans which Britain would accept for settlement of the Iranian oil dispute.

British diplomatic circles in Teheran also said their government was prepared to give up all its claims to the concession if Iran paid suitable compensation to Anglo-Iranian Oil Co., Ltd. It was pointed out that Iran could obtain a loan from the International Bank for Reconstruction and Development by mortgaging the oil installations and pledging the oil revenue.

The third suggestion was for a settlement on the basis of Britain's long-standing offer to enter a 50-50 partnership with Iran to operate the industry. With either the partnership arrangement or the long-term sales contract, Britain would not call on Iran to pay compensation.

Outlook gloomy. — There was little prospect that Iran was prepared to end the deadlock by agreeing to any of these methods of settlement. The diplomatic sources in Teheran who mentioned the three possible plans emphasized that they merely outlined fundamental principles which Britain adhered to and that no new proposals had been submitted to the Iranian Government.

The latest action taken by Iran against British interests—the closing of all British consulates in the country—pointed to an even harsher attitude on the part of the Iranian Government. Charges were made that the step was a political move allowing the Iranian Government to capitalize further on anti-British sentiment in the country.

The $1.10 a barrel at which Britain would buy Iranian oil was the first definite figure mentioned in this respect. It was 65 cents below the prevailing crude price in the Persian Gulf. Apparently this discount under a long-term contract would be considered compensation for the seizure of the Iranian properties.

Anglo-Iranian's marketing organization is the only one available which would handle Iranian production on a volume basis, and it has been pointed out the company would not take crude from Iran for more than it could obtain it elsewhere, from its own producing interests such as in Iraq and Kuwait. On the other hand, Prime Minister Mossadegh of Iran has indicated Iran demands the full prevailing price for the production.

Discussed in U. S.?—Whether any new approach to Iran on the oil issue was decided on by British Prime Minister Churchill and President Truman during their Washington conferences was a matter of speculation. The official communique summarizing results of the talks said that Churchill and Truman had agreed to give their joint support to the proposal that the World Bank take the lead in working out a settlement.

The World Bank's plan, under which it would operate the industry with a third of the profits going to Iran, has already been virtually rejected by Dr. Mossadegh. Other unofficial reports out of Washington said that Churchill had agreed, at United States' insistence, to make new efforts to reach a settlement.

EUROPE

Oil's Role Cited

It played major part in helping to rebuild Europe

PETROLEUM has played a major role in the rebuilding of Western Europe, for it was as universal a need as the money, engineering skill, or enterprise required to carry out successfully the Marshall plan.

In a report by the former Economic Cooperation Administration, whose activities are now carried on by new Mutual Security Agency, full recognition is given to petroleum's part in the reconstruction. Released by the Paris office of the special United States representative, it points out that petroleum fuel was essential to the mechanization and development of European agriculture so necessary to support a population increase of 26,000,000.

Removal of restrictions in many countries on gasoline use, increasing consumption of fuel oil in industry, uncertainties of coal supplies, and the greater mobility and mechanization of industry as well as agriculture have all combined to raise European oil demand to a new high.

The statement reports that $1,200,000,000, or roughly one-tenth of all expenditures of Marshall-plan funds, went for petroleum and products. In addition 14 refining projects costing a total of $235,000,000 benefited by direct ECA aid to the extent of $35,000,000.

Refining in Europe of a major part of its oil requirements was an integral feature of the recovery program. In 1948-49, the specific dollar drain on account of oil was about $500,000,000. Before the war, dollar crude-oil imports were 53.3 per cent of the refinery requirements. This proportion will have been reduced to 18.8 per cent by 1952-53.

Refining goals.—The ECA statement calls attention to the 1952-53 refining goals which were outlined originally in the second report of the Organization for European Economic Recovery. This calls for a 65,100,000-ton refining capacity in Western Europe in 1952-53.

Total cost of refinery expansion in Western Europe since the end of the war and through 1954 is estimated at $1,018,000,000, of which about $169,000,000 is actual dollar expense. Pointing out that a large proportion of the expenditure on plant and specialized equipment was covered by American companies erecting refineries in Europe, the ECA statement said the remainder has been met by ECA aid and earned dollars in the countries themselves. ECA aid has been particularly applied to the purchase of equipment obtainable only in the United States and for engineering fees and royalties.

Production. — It is anticipated that total Western Europe oil production,

PROJECTED REFINING CAPACITY

(Metric tons—one million tons roughly equals 20,000 bbl. daily).

Austria	980,000
Belgium-Netherlands-Luxemburg	8,040,000
Denmark	30,000
France	16,950,000
Greece (project deferred)	
Italy	9,680,000
Norway	40,000
Portugal	320,000
Sweden	1,250,000
Switzerland	100,000
Turkey	60,000
United Kingdom	21,330,000
Germany	6,340,000
Total	65,120,000

including shale oil, will reach 4,000,000 tons by 1952-43, meeting approximately 6 per cent of European refinery requirements. ECA has participated in the exploration and development of Western Europe's own production, a program the agency said also was dictated by the incentive to save foreign exchange.

ECA said that extensive research and drilling in Western Germany and the Netherlands had substantially increased this production which now makes up more than 66 per cent of Western Europe's domestic output. There is a possibility of doubling production at France's Lacq field, now about 200,000 tons a year, or about 4,000 bbl. daily. The agency said the search for oil elsewhere in France is expected to prove fruitful. Only small quantities of oil have been found in Italy but exploration is continuing in the Po Valley and in the south.

New Products Line

150-mile French carrier to begin operations this fall

PRODUCTS are scheduled to begin moving through a new 150-mile 10-in. pipe line from refineries in Le Havre area on the French coast to Paris some time this fall.

Initial throughput of the government-sponsored line, about 31,000 bbl. daily, will be fed into depots in the western part of Paris. An extension to Juvisy on the other side of Paris will be completed in 1953.

The line will largely eliminate present shipments by rail and river tanker to the French capital, where 25 per cent of the country's petroleum products are consumed.

Progress. — Construction has been completed from Le Havre to the Shell-Berre refinery at Petit-Couronne and the Seine crossed at Aizier between Port Jerome and Caudebec. Crossings of the St. Adrian River near Rouen and the canal at Tancarville also have been made. A double crossing of the Seine at Gennevilliers was made in December. All work in the departments of Seine-Inferieure and Eure is finished.

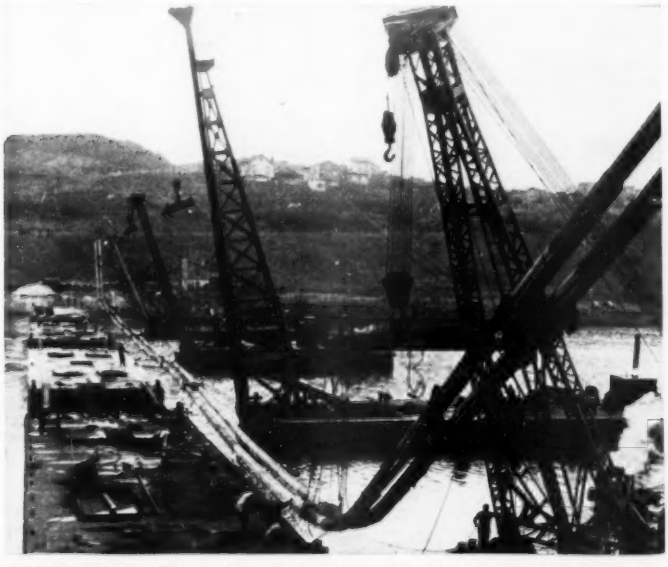
Pump stations are already built at the four dispatch points at the mouth of the Seine near Le Havre. These are located at Le Havre, the Cie. Francaise Raffinage refinery at Gonfreville at Port Jerome and Notre Dame de Gravenchon, and the Shell-Berre refinery at Petit-Couronne.

The Le Havre station has one centrifugal pump; the others have two, three, and two, respectively, all run by heavy-duty, synchronous motors. Pump efficiency is better than 80 per cent.

Receiving points in the Paris area are limited at present to 11, but branch lines from the terminals will serve most of the existing Paris depots.

Protection.—The entire line will be welded with a two-layer protective coating of bituminous and glass floss. In addition to installation of a cathode system for added exterior protection, nitrate of potassium will be injected regularly to prevent interior corrosion.

The government has entrusted construction and operation of the line to a mixed corporation, TRAPIL, in which the state has a controlling interest.



GOING DOWN.—The double submarine crossing of the Seine at Gennevilliers near Paris has here been hoisted off the string of river barges and is on its way to the river bed. Only one line will be placed in regular service. The other will be in readiness for emergency use.

AUSTRALIA

Plant Site at Freemantle

The new Australian refinery of Anglo-Iranian Oil Co., Ltd., is to be built at Freemantle on the western coast of the continent.

The Australian Government at Canberra announced it has concluded an agreement with the company for the construction of the plant at Freemantle. The Freemantle location is on the side of the Commonwealth toward the Middle East from which the plant will draw its crude.

Cost of the refinery has been estimated at between 30,000,000 and 40,000,000 Australian pounds, or the equivalent of about $67,000,000 and $90,000,000. Capacity will be approximately 3 million tons, or about 60,000 bbl. daily.

The Anglo-Iranian project is the largest of four new refinery-construction programs planned in Australia. Standard-Vacuum, Shell, and Caltex all plan new capacity. These projects promise to add nearly 120,000 bbl. daily to Australian refining capacity, now about 21,000 bbl. daily.

International Briefs

Cracking equipment is to be installed at the Ciudad Madero and Minatitlan refineries of Petroleos Mexicanos, Antonio J. Bermudez, Pemex director-general said recently in Mexico City. Work on the projects is to start in February. Cost is the equivalent of about $3,000,000.

Anglo-Iranian Oil Co., Ltd.'s, sixth 28,000-ton tanker, British Skill, was launched last week at Belfast, Ireland. Of the other five vessels of this size, the British Adventure and the British Bulldog are already in commission. British Talent is to undergo trials in the late February, and British Realm and British Crown in March and April respectively.

Harold T. Brown, representing oil companies in Fort Worth and Los Angeles, has made an offer for a drilling contract in Mexico, according to Antonio J. Bermudez, director-general of Petroleos Mexicanos. The Pemex head said offers also have been made by French and British companies which he refused to identify other than to say they had refining interests in Europe. Bermudez did not indicate what decision if any has been made on these proposals.

PERSONALS

Aramco Chairman

Davies, who found Bahrein reservoir, elected to post

FRED A. DAVIES, executive vice president of Arabian American Oil Co., has been named chairman of the board succeeding W. S. S. Rodgers who has resigned.

Davies, born in South Dakota and reared in Minnesota, received a mining-engineering degree from the University of Minnesota in 1916 and joined Anaconda Copper Co. as a metallurgist. Later he joined the Army and was made a research assistant in the Chemical Warfare Service in Paris.

In the spring of 1922 he joined a subsidiary of Standard Oil Co. of California as a geologist. He worked in the Rocky Mountain area until 1930, when the parent company sent him to the Bahrein Island in the Persian Gulf to do several weeks of geological work. Upon his recommendations Standard acquired large holdings which its subsidiary, Bahrein Petroleum Co., Ltd., has been developing. The first wildcat test proved a producer.

He returned from Bahrein in the fall of 1930 and was transferred to Texas in the spring of 1931 as assistant manager of The California Co., subsidiary of Standard of California.

In 1934 he was sent back to the Middle East as manager of the company's interests in Bahrein and later in Arabia. In 1937 he returned to this country and spent the next 2 years as manager of production for Bahrein Petroleum Co. with offices in New York.

In 1939 he was transferred to San Francisco as assistant manager of Standard of California's foreign division, and in September 1940 he became president of California Arabian Standard Oil Co. This company later became Arabian American Oil Co., and in 1947 Davies was named vice president in charge of production and exploration for Arabian American. In 1949 he was elected executive vice president of Aramco and vice president of Trans-Arabian Pipe Line Co.

(For a story on Aramco's new organizational setup, see International).

Dale R. Snow, a vice president and director of Sunray Oil Corp., has resigned his position as an active officer of the company because of his desire to devote more time to his personal interests. He will remain a member of the board of directors and will have an office with Sunray in order to serve in a consulting capacity. After graduating from University of Chicago in 1916, Snow joined Roxana Petroleum Corp., and in 1919 became associated with the old Marland Oil Co. He joined the Waite Phillips organization in 1920, and when the company merged into the former Barnsdall Oil Co. in 1925 he became chief geologist. When Barnsdall merged with Sunray in 1950, he was elected director and a vice president of the enlarged corporation.

George K. Kline has been appointed chief engineer for Peoples Natural Gas Co. at Pittsburgh, Pa.

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W. O. Twaits, a director of Imperial Oil, Ltd., and general manager of its producing department, has been elected a vice president of the company. Twaits joined the firm at Sarnia, Ont., Canada, in 1933 after graduating from University of Toronto. He served in various departments of the company at Sarnia, Calgary, and Toronto before becoming a member of the board of directors in 1950.

J. C. Martin, Jr., has resigned his position as division manager in Canada for Bay Petroleum Corp. to accept an appointment as vice president and manager of Rio Tinto Alberta Oils, Ltd., and Punch Petroleums, Ltd. He will have offices in Calgary, Alta., Canada.

Harry G. Fair, superintendent of Phillips Petroleum Co.'s Kansas City, Kans., plant, has been named the outstanding young man of the city in the annual presentation by the Kansas City, Kans., Chamber of Commerce.

R. H. Coe, division superintendent for Tide Water Associated Oil Co. supervising operations in East Texas, North Louisiana, and southern Arkansas, has been appointed division superintendent at Midland, Tex., to supervise the producing and development activities in West Texas and Southeast New Mexico. **R. B. McGuire** will succeed Coe in his former position.

Paul Harper, former Kansas division geologist for Cities Service Oil Co., has joined Anschutz Drilling Co. in Wichita. He was with Cities Service for 15 years.

Edward R. Valentine has resigned as vice president and treasurer of Fullerton Oil Co. to devote more time to his duties as president and chairman of the board of directors of J. W. Robinson Co.

Ralph Marshall has resigned as vice president of Drilling & Exploration Co. to become associated with Cypress Oil Co. of Los Angeles.

John M. Vetter has been elected first vice president of Pan American Gas Co. at Houston. In addition to this position, Vetter is also first vice president of Pan American Production Co.

Lester LeFavour, Michigan district production superintendent for Gulf Refining Co. for the past 9 years, will be transferred to Casper, Wyo., February 1, where he will establish and head a new Rocky Mountain district production office.

Herschel J. Wood was elected president of the Houston chapter of Nomads at the January meeting. Other new officers are: **Robert K. Franklin,** vice president; **E. F. Baldwin,** secretary; **Madden T. Works,** assistant secretary; **C. L. Clausel,** treasurer; **W. L. Childs, Jr.,** assistant treasurer; **Fred Christanelli,** sergeant-at-arms; **Ed Louden,** assistant sergeant-at-arms; **E. L. Lorehn** and **Noble Endicott,** regents; and **Harry E. Estes,** executive secretary.

W. E. Landrum, regional engineer at Ponca City, Okla., for Continental Oil Co., and **R. W. Frensley,** assistant Kansas district geologist in Wichita, have resigned and established Landrum & Frensley, a petroleum-consultant firm in Ardmore, Okla.

PERSONALS

F. A. Callery and **Harry Hurt,** partners in the firm Callery & Hurt, Inc., independent operators at Houston, have dissolved partnership, and the firm will now be known as F. A. Callery, Inc.

Richard N. Spencer has resigned as district geologist for Union Oil Co. of California in South Texas to become associated with Fitzpatrick Drilling Co., Corpus Christi, and A. C. Allyn & Co., Chicago, as geologist.

R. A. Wright, division superintendent of Sinclair Oil & Gas Co. at Midland, Tex., has been promoted to assistant general superintendent and transferred to Tulsa. Other reassignments and promotions in the production department include **W. T. Crandall,** division superintendent at Fort Worth, Tex., transferred to Midland to head the company's West Texas - New Mexico division; **J. B. Kennedy,** assistant division superintendent at Midland, transferred to Casper, Wyo., to head the firm's Wyoming - Montana division; **J. A. Jackson,** assistant division superintendent at Casper, transferred to Independence, Kans.; **Connie L. Wilson,** general staff engineer at Forth Worth, transferred to Tulsa as senior engineer in the reservoir section; **George H. Gray,** division engineer at Midland, transferred to Fort Worth as engineer assigned to handle engineering phases of proration and other matters before the Texas Railroad Commission; and **William J. Rogers,** division engineer at Fort Worth, transferred to Midland as division engineer for the West Texas - New Mexico division. **Floyd Brett,** assistant general superintendent, has returned from leave of absence as assistant to the director of the production division of the Petroleum Administration for Defense in Washington, D. C., and has resumed his duties as assistant general superintendent in the general production office at Tulsa.

R. A. WRIGHT

W. T. CRANDALL

FLOYD BRETT

GAS ENGINEERS MEET.—Presiding officers and speakers at the gas-hydrate control conference held last week in Norman, Okla., included the men shown here. Left to right are J. H. Sullivan, Atlantic Refining Co., Dallas; William H. Carson, dean of the University of Oklahoma college of engineering; John M. Campbell, Black, Sivalls & Bryson, Inc., Oklahoma City; Carl E. Cloud, general superintendent of Oklahoma Natural Gas Co., Tulsa; and R. L. Huntington, professor of chemical engineering at the University of Oklahoma. For a news story on the meeting, see Industry Affairs.

Kenneth A. McDaniel has been transferred from Lima to Toledo, Ohio, to become general superintendent of the Standard Oil Co. (Ohio) Toledo refinery. He succeeds **Clyde O. Rowley,** who has retired. A chemical-engineering graduate of Ohio State University, McDaniel joined Sohio as a laborer at the Lima refinery 14 years ago.

Daniel L. Pastell, with the petroleum laboratory of E. I. du Pont de Nemours, Inc., has been awarded the Horning Memorial Award by the Society of Automotive Engineers for his paper entitled "Precombustion Reactions in a Motored Engine."

L. W. Ashmore, exploration geologist for Magnolia Petroleum Co.'s district office in Midland, Tex., has resigned and will open offices there as a consulting geologist and independent. He has been with Magnolia for the past 12½ years.

R. R. Eckart, Jr., has been named production geologist for Shell Oil Co.'s New Orleans area. A member of the Shell organization since 1941, Eckart was transferred from Donaldsonville, La., where he was division geologist.

John J. Waybright has been named manager of Esso Standard Oil Co.'s Everett, Mass., refinery, succeeding **Charles H. Cole,** now assistant manager of manufacturing for Creole Petroleum Co., Caracas. Waybright has served the past 6 months as assistant to the general superintendent at Esso's Bayway, Linden, N. J., refinery.

W. B. Uderski, formerly chief of the petroleum and coal division of the United Nations Relief and Rehabilitation Administration, has joined D. D. Feldman Oil & Gas Co. He will head the new East Coast offices opened by the firm in New York City.

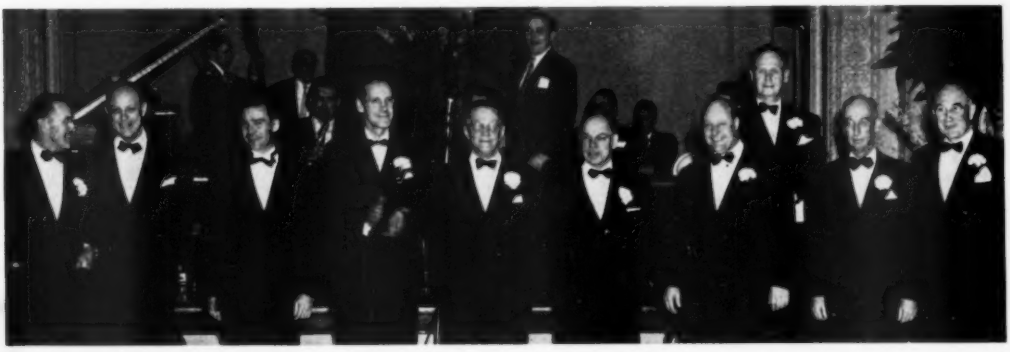
H. A. Johns, chief construction engineer, and **R. C. Sanders,** division superintendent for Gulf Refining Co., Houston pipe-line division, are directing construction operations for the West Texas Gulf Pipe Line Co. project. **F. K. Irwin, Jr.,** district foreman, is supervising construction for the project in the Hillsboro, Tex., area.

John C. Dean, manager of the industrial district of Socony-Vacuum Oil Co.'s New England division, will become manager of the industrial division of the company's lubricating department on February 1. He succeeds **P. W. Judah** who was recently made manager of the lubricating department.

Lyman C. Dennis, formerly district geologist for Pure Oil Co., has resigned and opened offices in Wichita Falls, Tex., as a consulting geologist. Dennis, who has been with Pure for the past 14 years, will continue as president of the North Texas Geological Society. **Leroy J. Conn** replaces Dennis at Pure's Wichita Falls office.

John F. Anderson and **William F. Cooke** have opened geological consulting offices at Houston. The new

PERSONALS



NEW NOMAD OFFICERS.—Executives for 1952 of the Tulsa chapter of Nomads are shown here attending the annual inaugural ball. Left to right are Opie Dimmick, Century Geophysical Co., president; R. E. Kirberger, Unit Rig & Equipment Co., vice president; Gilbert Swift, Well Surveys, Inc., secretary; J. S. George, Hughes Tool Co., assistant secretary; Arch Campbell, General Motors Co., treasurer; R. C. Glover, Baker Oil Tools, Inc., assistant treasurer; J. H. Beesley, Baroid Sales Division of National Lead Co., sergeant-at-arms; H. M. Cooley, Bethlehem Steel Co., outgoing president; Don L. Collins, Republic Supply Co., deputy sergeant-at-arms; and G. F. Coons, National Tube Co., regent. The annual social event was held in the Crystal Ballroom of the Mayo Hotel.

firm will be known as Anderson & Cooke, Oil Exploration Consultants. Anderson was formerly exploration manager and director of Warren Petroleum Co., and Cooke was district geologist for Atlantic Refining Co.

D. G. Debo, formerly assistant superintendent of the mechanical division at the Whiting refinery of Standard Oil Co. (Ind.) has been promoted to general foreman in the refinery's pressure-still department, light-oils division. He is succeeded by **J. H. Johnsen. E. J. Luetzelschwab** has been named general foreman in the crude-still department, light-oils division.

James B. Turner, field mechanic supervisor for Shell Oil Co. at Corpus Christi for the past 3 years, has been transferred to Calgary, Alta., Canada, on a 2-year assignment. **W. B. Campbell** has been transferred from Houston to Corpus Christi replacing Turner.

Norman E. Tilden, Shreveport, who has been acting assistant chief engineer of Interstate Oil Pipe Line Co.'s southern division, has been officially named to that post. Tilden joined Oklahoma Pipeline Co., predecessor of Interstate, in 1942 as a junior engineer.

C. B. Archibald, formerly chief technologist at the Shellburn refinery of Shell Oil Co. of Canada, Ltd., Vancouver, B. C., has been promoted to assistant refinery manager. At the same refinery, **L. M. Sanford** has been moved up from technologist to process engineer.

Gus Mistrot, engineer in the Corpus Christi office of the Texas Railroad Commission, will join Heep Oil Corp. at Sinton, Tex., February 1.

J. C. BAILIE

J. C. Bailie, assistant chief chemist at the Whiting, Ind., research laboratories of Standard Oil Co. (Ind.), has been promoted to chief chemist at the company's Neodesha, Kans., refinery. **W. J. Tancig,** group leader, has been advanced to assistant chief chemist at the Whiting refinery. Dr. Bailie, who has been with Standard since 1939, succeeds **H. V. Knight,** who has been transferred to the manufacturing department at Neodesha. Three other Standard research men promoted to the rank of group leader at the Whiting laboratories include: **J. A. Anderson,** formerly research chemist; **D. S. Gray,** formerly automotive engineer; and **V. A. Smith,** formerly chemist.

J. E. Springer, formerly district superintendent for Tide Water Associated Oil Co. at Midland, Tex., has been transferred to Conroe, Tex. Other changes include: **J. W. Clark,** district foreman, transferred from Conroe to Crane, Tex.; **W. G. Ray,** district foreman, transferred from Crane to Eureka, Kans.; and **R. V. Berry,** district foreman at Kilgore, Tex., promoted to district superintendent.

DEATHS

Ralph B. Pierce, superintendent of the Lemont, Ill., refinery of Globe Oil & Refining Co., died recently. Prior to World War II he was associated with Arkansas Fuel Oil Co., Shreveport.

F. E. Lacaze, 63, died January 22 at Shreveport. Lacaze was associated with United Gas Pipeline Co. and its predecessor firms for more than 37 years. He served as Shreveport district superintendent of Atlas Oil Co. and district manager for United Gas from 1919 until his retirement in 1949.

Harry J. Kelly, 61, retired manager of the construction and maintenance division of the manufacturing department of Gulf Oil Corp., died January 21 in Pittsburgh. Kelly retired December 31.

B. H. Bohannon, 63, who retired 2 years ago from Sinclair Refining Co., died January 20 in Tulsa.

L. S. Sinclair, 60, formerly vice president of Magnolia Petroleum Co., died at Baylor, Tex., January 16. He had joined Magnolia in 1914.

Charles P. Clayton, 78, former associate of the late John Gates, died January 17 at Hutchinson, Kans. The oil company they formed later became the production department of The Texas Co. Clayton resigned from Texaco in 1915 and formed Clayton Oil & Refining Co., at Dallas.

Refinery Money-Saver

A simple maintenace procedure at Humble's Baytown plant saves replacement of entire packing-gland liners

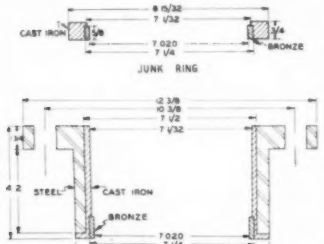
IN refinery maintenance, it's often the little things which count when it comes to saving money, manpower, and materials.

Humble Oil & Refining Co. has found that often the simple maintenance methods—used in the right places at the right time—also result in safer working conditions and more efficient operations.

For example, the use of small replaceable bronze bushings in packing glands and junk rings on hot-oil pumps for cracking coils, it was found, eliminates the frequent necessity of replacing entire packing gland liners and junk rings.

Before.—During the year before this practice was initiated, it was necessary to recondition 38 hot-oil pump plungers. The plungers required dressing down to remove scores, etc., after which, in about three cases out of four, new packing-gland liners and junk rings were necessarily machined to fit them. The old liners were saved and about 25 per cent of the time it was possible to reuse them in other plungers.

The new method.—This merely requires the machining of a recess in each liner and ring. They are then fitted with a standard (outside diameter) bronze bushing, but having an inside diameter that fits the particular plunger being repaired. With the new practice, as each plunger is reconditioned, it is only necessary to machine two small ring bushings rather than a new liner and junk ring—about three-fourths of the time.



SAVINGS.—This drawing of junk ring, top, and packing gland on hot-oil pump plungers shows how bronze bushings are inserted in machined recesses, thus eliminating replacing entire ring and packing gland liner.

A second feature of the installation is its elimination of a potential hazard. Plunger packing which could be blown out of a hot-oil pump can be a danger spot in operating equipment, and the new arrangement minimizes this condition.

Esso Centralizes 100 Temperature Records

A 100-point temperature-recording problem at Esso Standard Oil Co.'s Bayonne, N. J., refinery, was solved by installing a single multipoint, multibank recorder.

The instrument is used in a lube oil phenol-extraction plant. The complex unit presents a man-sized temperature-recording job. Thermocouples are located at heat exchangers, tower, coil outlet, feed lines, drums, strippers, and other critical points in the process.

Types of operation on the multipoint, multibank recorder include: 1, Continuous indicating and no recording with all points checked in succession. 2, Indication as long as no thermocouple point exceeds its preset temperature limit (if any point should exceed limit, the recorder automatically starts recording all points and sounds alarm to summon operator. Thermocouples grouped in banks of 20 and a different temperature limit can be set for each bank). 3, Continuous recording of all points. 4, Selective indicating or recording of any thermocouple or bank of 20 thermocouples (useful for trouble-shooting).

Liquid Bromine Mixer Wins $2,000 for Two G-P Refiners

A glass device which more effectively mixes bromine into cooling-tower water has been designed by two employes at General Petroleum Corp.'s Torrance, Calif., refinery.

A $2,000 award was split by Paul Dorrin, pipe fitter, and Victor E. Thompson, glass blower, who designed and built the device used in the refinery's water treating system. Bromine kills bacteria and algae growth and prevents fouling of the water-circulating system.

Liquid bromine is currently classified as a critical defense material, and in the 14 places throughout the refinery where the new device has been installed, an estimated 80,000 lb. of the chemical will be saved annually.

$1,000 SMILES (before taxes!)—Paul Dorrin, left, and Victor E. Thompson, of General Petroleum Corp.'s Torrance, Calif., refinery, who won $1,000 each for a new glass liquid-bromine mixer.

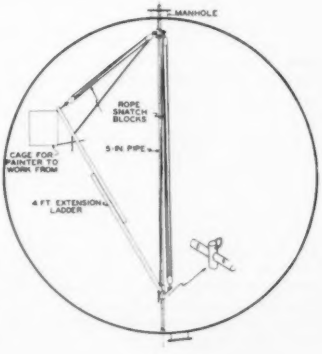
Portable Scaffold Speeds Tank Blasting, Painting

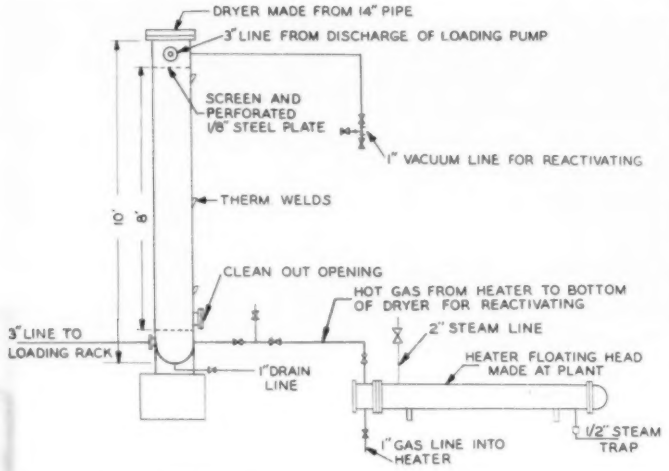
A portable scaffold conceived by E. C. Jennings, plant foreman for Phillips Petroleum Co. at Phillips, Tex., has proven to be a time and labor saver in sand blasting and painting of ball-type tanks.

The scaffold is built on a revolving gin pole *(see drawing)* with three adjustments for a working cage.

Gin pole consists of 3-in. pipe extending through the top manhole, with connections for keeping it stable.

Two rope blocks are required for two of the adjustments on the scaffold. A cage constructed of ¾-in. pipe with 2-in. wood floor suspended from the end of a 40-ft. aluminum extension ladder constitutes the working area of blaster or painter. The pivot base for the ladder is made of 3-in. pipe with a 4-in. sleeve to revolve on the gin pole. This scaffold is constructed for entrance to tanks through a 16-in. manhole.




DRYER MADE FROM 14" PIPE
3" LINE FROM DISCHARGE OF LOADING PUMP
SCREEN AND PERFORATED 1/8" STEEL PLATE
1" VACUUM LINE FOR REACTIVATING
THERM WELDS
10' 8"
CLEAN OUT OPENING
HOT GAS FROM HEATER TO BOTTOM OF DRYER FOR REACTIVATING
3" LINE TO LOADING RACK
2" STEAM LINE
HEATER FLOATING HEAD MADE AT PLANT
1" DRAIN LINE
1/2" STEAM TRAP
1" GAS LINE INTO HEATER

EFFECTIVE DRYER.—Diagram showing layout of propane dryer.

Propane Dryer

Moisture removal by new Gregg-Tex unit effective

A PROPANE dryer which will remove moisture from 120,000 gal. of plant product before any trace shows on a tester has been designed by Robert Lupfer, controls-maintenance department, Gregg-Tex Gasoline Corp., Longview, Tex.

The dryer was fabricated at the company's plant and set on the discharge of a propane pump to the loading-rack line. The pump takes suction from storage tanks and discharges through the activated alumina bed of the dryer into the loading line *(see drawing)*.

Lupfer, who gave details of his dryer to the Natural Gasoline Association of America at its "Operating Kinks" session held at Tyler, Tex., says that this procedure eliminates all traces of moisture in propane.

How it works. — Propane from the storage tanks enters top of the dryer, goes down through the 8-ft. bed of activated alumina, and discharges from a 3-in. bottom outlet into the loading line. The alumina bed is reactivated after use each day for 4 hours, with hot residue gas at the rate of 14,000 cu. ft. per hour.

To reactivate or dry the bed, the propane pressure is released through the 1-in. line tied into the plant gas-intake scrubber. This is done at a slow rate, Lupfer reports, in order to prevent overloading the compressors during heavy gas loads.

After pressure is released, hot residue gas from a heat exchanger nearby is fed into the bottom of the dryer, passing up through the alumina bed, and out at the top through the 1-in. connection to the plant intake scrubber.

Color Data Ready

Saybolt vs. Lovibond is determined by Texas firm

DATA are now available through Eastern States Petroleum Co., Houston, on comparison of Saybolt chromometer colors with Lovibond colors, which should prove valuable to refiners supplying products to foreign specifications.

A blending problem recently required the exact comparison between values obtained with a Saybolt chromometer and the Institute of Petroleum Technology scale on a Lovibond tintometer when an English purchaser desired a finished product having an I.P. No. 4.

Inquiries made at local inspection laboratories and other refiners in the nearby area gave values which were relatively close in the lower I.P. range, but they became widespread in the upper range. However, values reported by one major company compared closely to the Table of Color Comparison (Table 1).

A Saybolt value closely corresponding to the purchaser's specifications was desired. Consequently it was decided to obtain actual values on a Lovibond tintometer and compare readings received with the same sample tested on a Saybolt instrument.

Laboratory blends were made using a 30 Saybolt kerosine which was blended down with dye to the different colors shown in Table 2. From values received it could be seen that I.P. No. 4 is about equivalent to a 13 Saybolt number by interpolation.

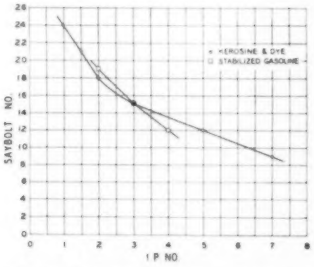
A similar test was made to check the Nos. 3 and 4 colors with undyed material. Samples of stabilized gasoline were used to blend down 30 color kerosine and values were reported on Table 3. From this test, the lowest color obtainable on the Saybolt chromometer equivalent to an I.P. No. 4, was 12.

TABLE 1

Table of Color Comparison as Shown in Volume 2, Science of Petroleum, Page 1393

I.P. No.	Saybolt No.
Standard White	
4.0	From 1
3.5	to 15
Prime White	
3.0	From
2.75	16
2.5	to
2.25	20
Superfine White	
2.0	(*)
Water White	
1.5	From 21
1.0	to 25

*Not reported.



COLOR COMPARISON. — Curves comparing Saybolt - Lovibond (I.P.) colors.

TABLE 2

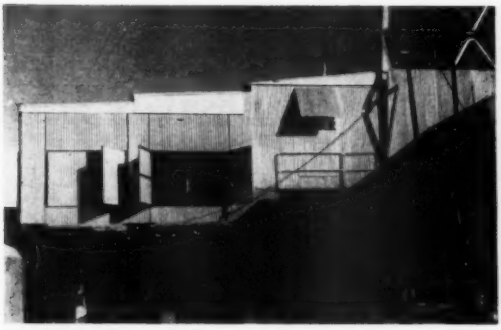
Actual Color Comparison Using 30 Saybolt Color Kerosine and Dye

I.P. No.	Saybolt No.
7	9
6	
5	12
4	
3	15
2	18
1.5	21
1.0	24

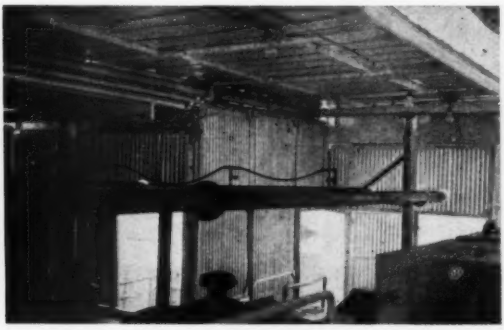
TABLE 3

Actual Color Comparison Using 30 Saybolt Color Kerosine and Stabilized Gasoline

I.P. No.	Saybolt No.
4	12
3	15
2	19



PHILLIPS RIG.—Phillips Petroleum Co.'s Rig 32 is equipped with sectional building with "stair-step" roof, which houses drilling engines and draw works.



ROOF DETACHABLE.—Looking down exhaust pipe from one of the two engines beneath roof sections. Roof framework can be taken down easily for moving.

Sectional Rig Building

Three-unit house designed by Phillips Petroleum Co. is integral with drilling engines and draw works on Rig 32

PHILLIPS PETROLEUM CO. has devised a three-unit sectional building which is integral with the drilling engines as well as the draw works on its Rig 32. This rig has been working in Denton pool, in Lea County, New Mexico, northeast of Lovington.

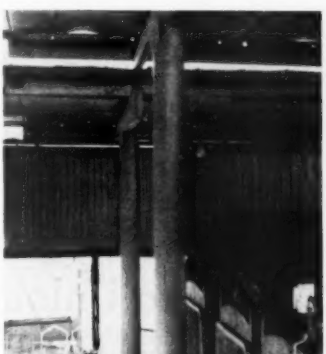
Features of the building are that:

1. It doesn't have to be erected or torn down every time a new operation is started or a well completed.
2. It not only serves as a shelter for twin-engine installations, but offers ample protection for the draw works.
3. It has a pipe framework for the roof, which can be taken down easily and quickly, and shipped separately or stored flat beside the rig without danger of damage.
4. Only two supporting posts carry the load of the entire structure.
5. It has casement windows, assuring adequate ventilation.
6. Men can pass freely throughout the rig.
7. None of the three sections is actually tied together, but design provides that close joints are effected when engines and draw works have been rigged up and placed in operating position.

"Saw-tooth construction."—Design of the building sections covering each twin-engine installation and the draw works could be called "saw-tooth construction." It is, in effect, a flat roof lean-to, with roof sloped enough so that water can drain adequately.

The roof section covering the draw works is the tallest of the three sections. The basic construction idea is carried out in all three sections. Roof framework, of long pipe sections, support weight of the corrugated side panels and flat metal roof. Top sills of the sections are of different heights, to attain good water drainage. Horizontal member nearest the derrick is wider than the next, and each of the three house sections is lower than its adjoining section.

One of the supporting posts for the building is set on the skid foundation near the spinning cathead, and the other on the opposite end. These are 3-in. line pipe with horizontal cross-sections at the top made of shallow channel iron, which are welded to the pipe stills running at right angles to the top cross pieces. Vertical sections of conventional corrugated siding are attached to the roof sections, and doors and windows are more or less permanent.



SUPPORT.—One of the supporting members for the roof.

On the mud-pump side of the rig the last building section is provided with a wall and doors.

Engine mountings.—While each engine in the twin installation on Phillips' Rig 32 is tied permanently to its neighboring twin, facilities are provided to enable the mechanics to remove any one if and when a replacement is necessary. Operation of the individual engine is exactly the same as in other settings where the individual engine is anchored to the substructure in a conventional installation.

The only substantial difference between Rig 32 and others is that cross-members have been connected across the engine skid bases to support the building.

Pin-Wheel Mud Gun

Device runs on pressure of circulating mud pumps

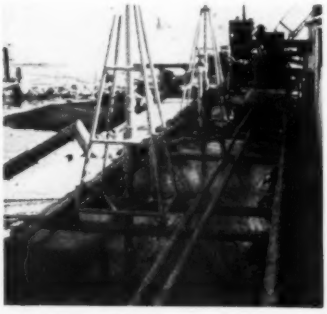
ONE drilling contractor operating in the Southwest has practically eliminated the conventional mud gun and is using a "pin wheel" type device which operates from the pressure of the circulating mud pumps.

The apparatus is supported above the steel mud tank by means of a small four-legged derrick which is mounted on a pair of cross-members attached to opposite sides of the tank. It sets within this small derrick,

MUD "PIN-WHEELS." — Details of automatic mud gun, and mounting.

where a stationary pipe is bolted to the crown of the structure supporting the mechanism, pointing down into the mud.

About midway between the crown and mud level is a packed joint that permits the bottom half to rotate freely. At the extreme bottom of the pipe which is free to rotate is a pinwheel head containing four arms which radiate outward and slightly bent so that all will point in the same direction around the circle formed by tips of the arms.



ON MUD TANKS. — Two pin-wheel mud guns on top of mud tanks.

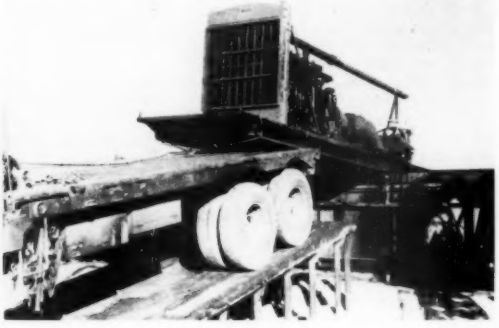
Prevent separation. — The extreme bottom of the rotating pipe, closed at the end, sets in a cup which supports it as well as serving as a bearing. Both the pipe and cup assist in preventing the packed section from separating.

Packing is a simple sleeve larger than both portions of the vertical pipe, which is stationary, with the upper part of the pipe set into the crown of the small supporting derrick.

A connection attached to the stationary part of the vertical pipe, just above the packing gland, supplies a means of connecting the pipe line which carries mud under pressure from the conventional mud pumps beside the rig.

Safe Plugging Tool

Phillips Pipe Line Co. has developed a plugging tool which offers safer operation in welding flanges and other fittings on ends of lines containing petroleum vapors. Unique feature is provision for tube extending through rubber cylinder plug. Plug is expanded tightly to shut off vapor or liquid flow. Pressure gage on bleeder connections at end of tube indicates when pressure increases to danger point. Bleeder can be opened for carrying off vapors by means of pipe or hose.



Truck Backs Up Ramp . . . to Unload Drilling Engine

A WEDGE-TYPE ramp has been devised by Brinkerhoff Drilling Co., Dallas, to save time in rigging up or tearing down a drilling rig.

The ramp, constructed with an adequate number of risers to support weight of the load placed upon it, is used by oil-field trucks to load and unload heavy equipment on the platform of the rig.

Planking is placed on each side where the dual wheels of the truck roll so that traction is assured when the truck backs upward toward the engine substructure.

Skidding.—When using the ramp to set an engine, the winch line of the loaded truck is attached to a bridle attached to the forward end of the engine skid foundation. Skidding the load from the truck is done with another truck on the opposite side of the rig, which pulls the load from the transport. The winch line on the loaded truck holds enough tension to prevent the engine from "jumping."

As the engine is moved away from the transport, the balance is toward the pulling truck, so that the forward end leaves the transport only after the skid foundation has made contact with all substructure.

Brinkerhoff, headed by copartners Zack K. Brinkerhoff, Sr., and Zack K. Brinkerhoff, Jr., operates 12 rigs. The two drilling superintendents are M. H. Brinkerhoff, Midland, Tex., and Bert Sager, Casper, Wyo.

ANNUAL REVIEW AND FORECAST SECTION

What the figures reveal . . .

DRILLING SCHEDULED — 10,931 wildcats and 34,515 development wells for a total of 45,446 with 179,514,000 ft. of hole.

DRILLING IN 1951 — 10,302 wildcats and 34,214 development wells for a total of 44,516 and 172,331,000 ft.

THE BREAKDOWN — 23,453 oil wells, 3,030 gas wells, 16,653 dry holes, and 1,380 service wells.

SUCCESS RATIO — 61.5 per cent of wells drilled for oil and gas were successful in 1951 compared with 65 per cent in 1950. Decrease due to high percentage of wildcat wells.

MORE DEEP HOLES — Wells drilled below 12,500 ft. gained 52.9 per cent in 1951.

MORE WILDCATS — These represented 23.1 per cent of all drilling in 1951 compared with 19.8 per cent in 1950. The 1952 program calls for 24.1 per cent wildcats.

RECORD CRUDE PRODUCTION — All-time high of 6,144,000 bbl. daily in 1951 for an increase of 745,000 bbl. daily over 1950 — largest annual increase in history.

NEW OIL STATES — Washington and North Dakota were added to list of oil-producing states in 1951.

RESERVES — Total for all liquid hydrocarbons at first of 1952 amounted to 31,796,000,000 bbl., up 1,844,000,000 bbl. for the year.

CRUDE RESERVES — These advanced 1,416,000,000 bbl., to 27,537,000,000 bbl. Reserves of natural-gas liquids increased 428,000,000 bbl., to 4,259,500,000 bbl.

NATURAL-GAS RESERVES — Estimated at 191.4 trillion cubic feet.

DEMAND — Total for 1952 forecast at 7,939,000 bbl. daily for an increase of 472,000 bbl. daily or 6.3 per cent.

LIGHT HYDROCARBONS — Production averaged 561,200 bbl. daily in 1951 and will be near 600,000 bbl. daily for 1952.

REFINERY RUNS — Gained 13.2 per cent in 1951 to 6,495,000 bbl. daily. An increase of about 5.7 per cent is expected in 1952.

WORLD PRODUCTION — Gained 1,283,000 bbl. daily despite loss of Iranian production for last half of year.

UTILITY SALES OF NATURAL GAS — Jumped 15.4 per cent in 1951 to almost 4.3 trillion cubic feet.

ROTARY RIGS operating in United States and Western Canada reached a peak of 3,150 in December 1951, about 660 rigs more than 1950 peak.

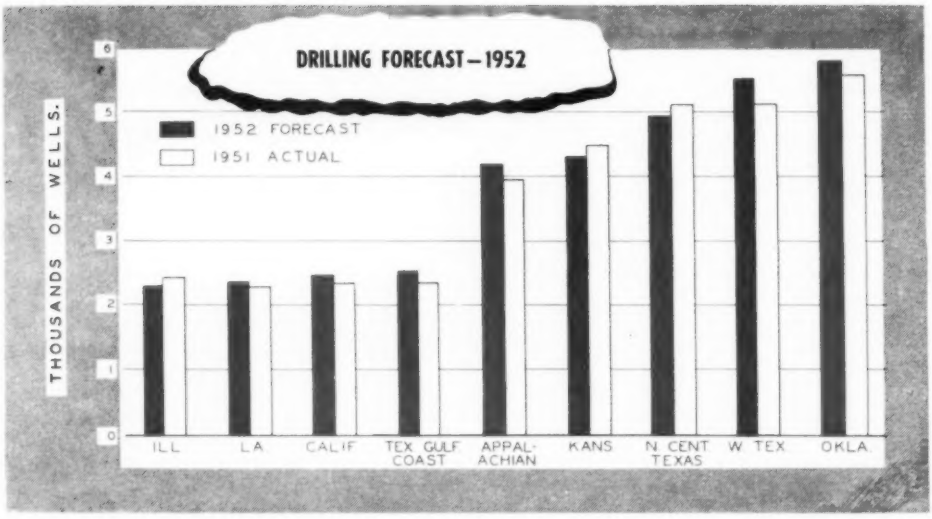
FIELD PROCESSING-PLANT CAPACITY will be increased by 1.3 billion cubic feet daily in 1952.

PIPE LINING — Another year of intense activity seen for crude, products, and gas lines in 1952.

REFINERY-EXPANSION PROJECTS will raise total input capacity to 7,360,000 bbl. daily this year.

- **A Backward Glance at '51**
- **A Forward Look at '52**

THE OIL AND GAS JOURNAL



Operators to Drill 45,446 New Wells

Shortage of steel will hold increase to fewer than 1,000 wells

by John C. Casper

THE oil industry will drill 45,446 new wells this year—an increase of 930 over 1951's all-time record but far short of the goal of 50,000 wells desired by both the industry and the Government.

Operators would like to drill a lot more than 45,446 wells during 1952, but they have scheduled this number on the basis of the quantities of steel they believe they will get, not on what they would like to have or what they consider desirable. Because of the need for increased reserves, major emphasis will be on exploratory drilling: 10,931 wildcat wells are scheduled for this year, a gain of 629 wells or 6.1 per cent over 1951, while there will be 34,515 field wells, an increase of 301 wells or only 0.9 per cent.

This forecast is based on replies from hundreds of operators to The Oil and Gas Journal's survey. Every oil area in the country was covered by answers to the drilling questionnaire. Operators were asked to give actual estimates of the wells they expect to drill in 1952, not the number they would drill if they could get the pipe. Many indicated that the programs presented were what they considered minimum for the year and that additional drilling would depend on the availability of steel. Final state totals were shaded in some cases by operators' comments on the general outlook for particular areas this year.

The present need for an increase in reserve producing capacity would cause a much larger increase in drilling if pipe were available. Look at this trend: In 1950 crude production increased 7.1 per cent and wells drilled increased 10.8 per cent; in 1951 crude production increased 13.8 per cent but a shortage of pipe held drilling to an increase of 2.9 per cent; the forecast for 1952 is an increase in crude production of 4.7 per cent and an increase in new wells of 2.1 per cent.

It was noted from the survey returns that the increase in wildcatting is not confined to recently opened areas. Exploratory drilling for 1952 in most of the older sections is expected to exceed 1951. Total wildcat wells for 1952 will represent 24.1 per cent of all drilling, establishing another new record for the year.

DRILLING FORECAST—1952

	Total wildcats	Total field wells	Total wells	Total footage (thou. ft.)
1952 forecast	10,931	34,515	45,446	179,514
1951 actual	10,302	34,214	44,516	172,331
1952 forecast vs. 1951 actual	+629	+301	+930	+7,183
Per cent change	+ 6.1	+ 0.9	+ 2.1	+ 4.2

Principal increases for 1952:	Total wells
West Texas	+468
Oklahoma	+216
New Mexico	+215
Southern Louisiana	+213
Appalachian	+220
Rocky Mountain	+207

Drilling Forecast for 1952 by Areas

	1952 Forecast				Change from 1951 actual			
	Wildcat wells	Field wells	Total wells	Total footage	Wildcat wells	Field wells	Total wells	Total footage
Alabama	25	26	51	275,000	4	—3	1	6,000
Arkansas	112	326	438	1,553,000	13	—4	9	31,000
California	536	1,882	2,418	9,791,000	—15	72	57	225,000
Colorado	178	142	320	1,579,000	35	—4	31	155,000
Dakotas	42	50	92	604,000	29	50	79	536,000
Illincis	898	1,381	2,279	5,677,000	25	—170	—145	—367,000
Indiana	586	695	1,281	2,296,000	27	—115	—88	—159,000
Kansas	1,052	3,275	4,327	14,487,000	46	—220	—174	—548,000
Kentucky	306	990	1,296	2,387,000	13	—26	—13	—25,000
Louisiana	454	1,887	2,341	15,876,000	75	26	101	1,687,000
Northern	246	891	1,137	4,447,000	36	—148	—112	—294,000
Southern	208	996	1,204	11,429,000	39	174	213	1,981,000
Michigan	345	366	711	1,765,000	13	—48	—35	—96,000
Mississippi	162	225	387	2,601,000	—12	24	12	62,000
Montana	74	245	319	787,000	24	33	57	147,000
Nebraska	157	112	269	1,163,000	23	5	28	119,000
New Mexico	139	849	988	4,796,000	34	181	215	1,019,000
New York	0	648	648	933,000		21	21	30,000
Ohio	46	922	968	2,052,000	11	—14	—3	—5,000
Oklahoma	894	4,948	5,842	21,355,000	64	152	216	813,000
Pennsylvania	35	1,880	1,915	3,510,000	25	152	177	382,000
Texas	4,571	12,426	16,997	79,722,000	163	179	342	2,945,000
Dists. 1 and 4 (SW)	748	1,512	2,260	10,155,000	18	—67	—49	—134,000
Dists. 2 and 3 (G.C.)	730	1,779	2,509	15,391,000	68	128	196	1,063,000
Dists. 5 and 6 (E)	234	860	1,094	5,222,000	—21	—59	—80	—381,000
Dists. 7-B and 9 (N)	1,852	3,080	4,932	15,699,000	—29	—56	—85	—318,000
Dists. 7-C and 8 (W)	960	4,621	5,581	31,230,000	116	352	468	2,997,000
Dist. 10 (PH.)	47	574	621	2,025,000	11	—119	—108	—282,000
Utah	48	23	71	391,000	16	16	32	178,000
West Virginia	24	623	647	1,864,000	7	18	25	95,000
Wyoming	145	578	723	3,677,000	4	—26	—22	—112,000
Miscellaneous	102	16	118	373,000	5	2	7	65,000
Total United States	10,931	34,515	45,446	179,514,000	629	301	930	7,183,000

The slight gain in development drilling may indicate a need for drilling up some of the areas opened by the extensive wildcatting program of 1951.

The trend toward larger increases in areas of deeper drilling will continue in 1952. The average well depth for the country has been increasing since the end of the war, and most of the increase has been due to larger gains in deep-drilling areas with some falling off in the states where the average depth for the state is less than the national average. Total wells and footage forecast for 1952 give an average well depth of 3,950 ft. compared with the previous all-time record of 3,871 ft. set in 1951. The shift in drilling to deeper areas accounts for a gain of 4.2 per cent in footage compared with the increase of 2.1 per cent for total wells.

Deeper drilling and a higher percentage of wildcats tend to prevent larger increases in completions and in total footage. More rig time per foot is required to complete either a wildcat or a very deep well. This accounts for at least a part of the big increase in number of rigs required to complete 2.9 per cent more wells in 1951. Since the same trend is expected to continue this year, the increase in number of rigs will be proportionately greater than the gain in well completions.

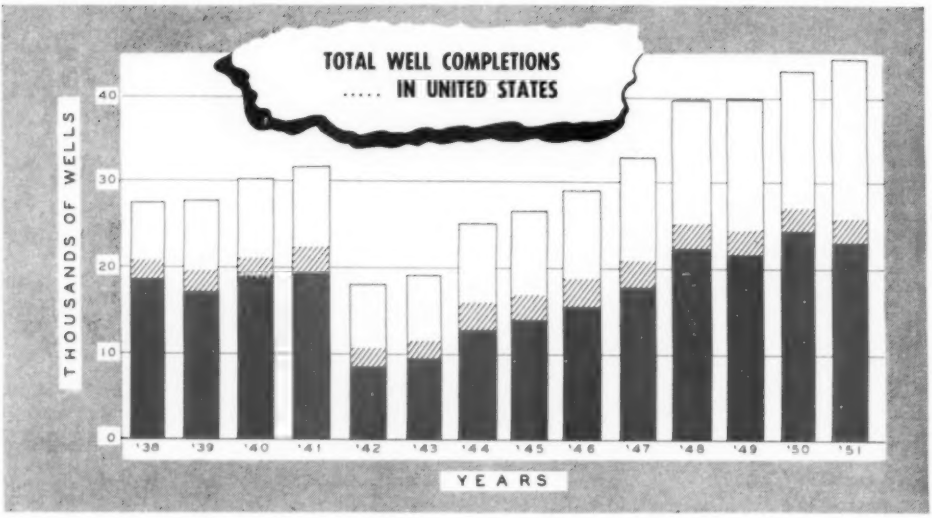
Operators' reports indicate another big year for West Texas and Southeast New Mexico. Many additional wells are scheduled for the Williston basin and other areas of the Rocky Mountain district. Intensified search for gas in the Appalachian district will probably bring drilling in the gas-producing areas above the level of 1951.

A tabulation of the reports from 37 large operators, including but not restricted to integrated companies, shows that these operators drilled 27 per cent of all wells in 1951 and plan to drill 29 per cent of the 1952 total.

As in past years, the larger operators had a smaller ratio of wildcats to total wells than did other operators. In 1951, 16.3 per cent of all wells drilled by this group were wildcats compared with 25.7 per cent for all other operators. The ratios for both groups will be higher this year.

POSITION OF LARGE OPERATORS IN 1952 FORECAST

1951 actual—	37 large operators	All other operators	Total
Total wells drilled	12,089	32,427	44,516
Per cent of total wells	27.2	72.8	100
Total wildcats drilled	1,976	8,326	10,302
Per cent of total wildcats	19.2	80.8	100
Ratio wildcats to total, per cent	16.3	25.7	23.1
Total field wells drilled	10,113	24,101	34,214
Total footage (thou. ft.)	59,049	113,282	172,331
1952 forecast—			
Total wells	13,256	32,169	45,425
Per cent of total wells	29.2	70.8	100
Wildcat wells	2,403	8,528	10,931
Per cent of wildcat wells	22.0	78.0	100
Ratio wildcats to total, per cent	18.1	26.5	24.1
Total field wells	10,853	23,641	34,494
Total footage (thou. ft.)	69,063	110,451	179,514



Well Completions Climb to New Record High

Operators finalize 44,516 holes, with total footage of 172,331,000 in 1951

by Philip C. Ingalls

BOLSTERED by an increased percentage of wildcat drilling, total well completions in the United States during 1951 climbed to a new record high and the footage drilled to set this new completion record was greater than in any previous year.

Previous records for number of completions and footage drilled during a year's time were set in 1950. During 1951 a total of 44,516 wells were completed, 1,237 more than the previous year. To complete these 44,516 wells, 172,331,330 ft. of hole was cut, 13,043,465 ft. more than the previous year.

These figures show smaller increases than were recorded for 1950 over 1949. During 1950 there were 4,241 more wells completed than during 1949 and 21,284,901 more feet of hole was cut. This decrease in the rate of acceleration of activity was a result of restrictions imposed on the industry by lack of steel.

Record Year Foreseen

The new drilling records set during 1951 were forecast at the middle of the year after replies to The Oil and Gas Journal's midyear drilling survey were tabulated.

This forecast showed that operators were planning to complete 44,495 wells during 1951; they completed but 21 more than that. This forecast also showed that an estimated 173.6 million feet of hole would be cut if drilling plans were not altered materially; actually, due to less shifting of activity from shallower areas to deeper areas than had been anticipated, footage drilled fell short of the expected by 1.3 million feet. *(See The Oil and Gas Journal, July 26, 1951, page 188-189.)*

Success Ratios

Out of the 44,516 wells completed in 1951, 23,453 were completed as oil wells and 3,030 as gas wells. Thus, exclusive of service wells (wells not expressly drilled for oil or gas such as those drilled for disposal, input, or storage), 16,653 dry holes were completed during 1951, 1,896 more than in 1950, a 13 per cent increase.

The number of wells that were successful in that they found some oil or gas was 61.5 per cent of the total drilled, excluding service wells, during 1951. This compares with 66 per cent in 1949 and 65 per cent in 1950.

This decrease in success percentage can be directly related to the percentage increase in the number of wildcat wells drilled, which in turn can be related to the influence of steel allocations. The number of exploratory wells drilled during 1951 was 20 per cent higher than during the previous year while development completions declined a little over 1 per cent. The success ratio of development completions was down slightly in 1951, being 72 per cent against 74 per cent for 1950.

Texas Dominates Activity

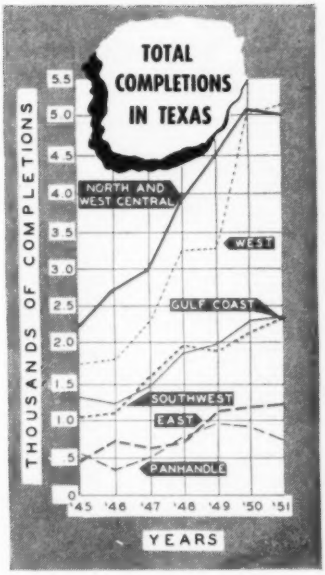
Texas accounted for over 37 per cent of the total completions in the United States. The big state had 43 per cent of the oil wells and 24 per cent of the gas wells that were completed, and nearly 45 per cent of hole made was cut in Texas. This state has so much activity that all other states are dwarfed in comparisons.

If Texas is divided into West Texas, North Texas, Texas Gulf Coast, and other Texas, total completions in the leading areas of activity would run as follows: Oklahoma, 5,626; West Texas, 5,113; North Texas, 5,017; Kansas, 4,501; other Texas, 4,212; Illinois, 2,424; California, 2,361; Texas Gulf Coast, 2,313; and Louisiana, 2,240.

Since 1946 there has been a steady increase in the

TOTAL UNITED STATES COMPLETIONS BY STATES

	Total comp.	Oil	Gas	Service	Dry	Average footage	Comp. 1950
Alabama	50	17	0	0	33	5,380	43
Arkansas	429	235	10	0	184	3,549	407
California	2,361	1,735	40	6	580	4,052	1,829
Colorado	289	103	12	0	174	4,929	99
Dakotas	13	1	0	0	12	5,202	15
Florida	2	0	0	0	2	10,047	13
Illinois	2,424	918	10	12	1,484	2,493	2,823
Indiana	1,369	434	18	5	912	1,793	1,534
Kansas	4,501	2,177	376	62	1,886	3,340	4,010
Kentucky	1,309	524	155	1	629	1,842	1,150
Louisiana	2,240	1,218	176	3	843	6,334	2,453
Northern	1,249	635	140	1	473	3,796	1,327
Southern	991	583	36	2	370	9,533	1,126
Maryland	45	0	28	0	17	4,106	3
Michigan	746	223	20	46	457	2,494	897
Mississippi	375	137	9	1	228	6,771	313
Missouri	18	0	2	0	16	649	27
Montana	262	144	8	0	110	2,443	270
Nebraska	241	77	13	0	151	4,330	171
New Mexico	773	350	254	0	169	4,886	607
New York	627	320	0	307	0	1,440	657
Ohio	971	334	226	67	344	2,119	1,027
Oklahoma	5,626	3,109	265	177	2,075	3,651	5,459
Pennsylvania	1,738	776	239	653	70	1,800	1,581
Texas	16,655	10,086	726	40	5,803	4,601	16,585
North Central (9)	2,691	1,378	11	24	1,278	3,133	3,021
West Central (7-B)	2,326	1,046	39	3	1,238	3,261	2,041
West (7-C & 8)	5,113	4,053	25	1	1,034	5,522	5,005
Panhandle (10)	729	350	294	2	83	3,165	889
Eastern (5 & 6)	1,174	739	30	1	404	4,772	1,164
Gulf Coast (2)	775	336	103	1	335	5,967	694
Gulf Coast (3)	1,538	931	106	0	501	6,309	1,614
Southwest (1)	601	301	10	1	289	2,908	509
Southwest (4)	1,708	952	108	7	641	5,001	1,648
Utah	39	8	1	0	30	5,473	17
West Virginia	622	79	419	0	124	2,844	652
Wyoming	745	442	21	0	282	5,086	615
Miscellaneous	46	6	2	0	38	1,998	22
Total 1951	44,516	23,453	3,030	1,380	16,653	3,871	
Total 1950	43,279	24,430	2,843	1,249	14,757	3,680	43,279
Total 1949	39,038	22,042	2,887	1,382	12,727	3,538	
Total 1948	39,778	22,585	2,897	2,270	12,076	3,454	
Total 1947	33,122	17,999	3,305	2,280	9,538	3,443	
Total 1946	29,229	15,851	3,090	2,237	8,051	3,321	



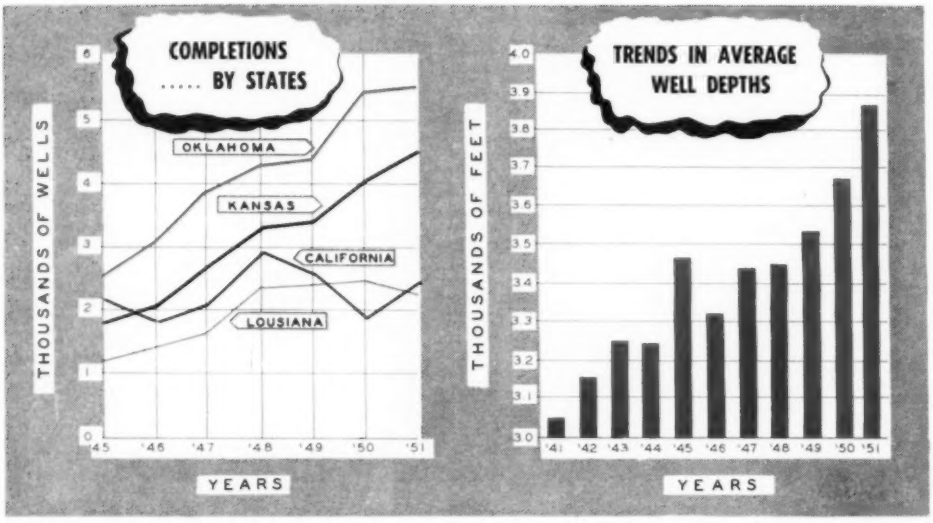
DRILLING METHODS—1951

	Total	Rotary	Cable
Alabama	50	50	0
Arkansas	429	426	3
California	2,361	2,355	6
Colorado	289	289	0
Dakotas	13	13	0
Florida	2	2	0
Illinois	2,424	2,230	194
Indiana	1,369	1,027	342
Kansas	4,501	4,073	428
Kentucky	1,309	995	314
Louisiana	2,240	2,240	0
Northern	1,249	1,249	0
Southern	991	991	0
Maryland	45	0	45
Michigan	746	459	287
Mississippi	375	375	0
Missouri	18	5	13
Montana	262	98	164
Nebraska	241	192	49
New Mexico	773	693	80
New York	627	0	627
Ohio	971	0	971
Oklahoma	5,626	4,782	844
Pennsylvania	1,738	1	1,737
Texas	16,655	15,767	888
North Central (9)	2,691	2,503	188
West Central (7-B)	2,326	2,163	163
West (7-C & 8)	5,113	4,691	422
Panhandle (10)	729	620	109
Eastern (5 & 6)	1,174	1,169	5
Gulf Coast (2 & 3)	2,313	2,313	0
Southwest (1 & 4)	2,309	2,308	1
Utah	39	39	0
West Virginia	622	0	622
Wyoming	745	700	45
Miscellaneous	46	9	37
Total	44,516	36,820	7,696

Wells drilled by rotary and finished by cable tools are included under rotary.

DEPTH CLASSIFICATIONS—1951

	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.
Alabama	1	21	19	6	3	0
Arkansas	110	257	35	24	3	0
California	756	968	376	158	81	22
Colorado	24	66	190	8	1	0
Dakotas	1	5	5	1	1	0
Florida	0	0	1	0	0	1
Illinois	934	1,488	2	0	0	0
Indiana	1,139	230	0	0	0	0
Kansas	517	3,933	49	2	0	0
Kentucky	1,029	280	0	0	0	0
Louisiana	495	466	356	394	422	107
Northern	477	405	233	106	28	0
Southern	18	61	123	288	394	107
Maryland	0	41	4	0	0	0
Michigan	419	321	6	0	0	0
Mississippi	3	63	203	75	27	4
Missouri	18	0	0	0	0	0
Montana	173	78	10	1	0	0
Nebraska	43	149	48	1	0	0
New Mexico	200	284	120	99	50	20
New York	627	0	0	0	0	0
Ohio	539	425	7	0	0	0
Oklahoma	1,719	2,721	894	174	113	5
Pennsylvania	1,553	106	77	1	1	0
Texas	4,033	5,891	4,681	1,616	358	76
North Central (9)	1,171	1,134	382	4	0	0
West Central (7-B)	897	1,077	352	0	0	0
West (7-C & 8)	798	1,213	2,414	451	173	64
Panhandle (10)	90	609	16	14	0	0
Eastern (5 & 6)	199	489	305	173	6	2
Gulf Coast (2 & 3)	188	669	617	687	145	7
Southwest (1 & 4)	690	700	595	287	34	3
Utah	10	11	9	4	4	1
West Virginia	296	301	24	1	0	0
Wyoming	65	342	244	73	18	3
Miscellaneous	34	8	3	0	0	1
Total	14,738	18,455	7,363	2,838	1,062	240



average depth of total completions in the United States.

During 1951 the average depth of a well completed was 3,871 ft., 550 ft. (16.5 per cent) greater than in 1946. This increase in average depth is the result of two factors: (1) Deeper drilling in old areas, and (2) shifting of activity to younger but deeper areas (from the shallower areas in the northeastern and north central states to the deeper areas in the southern and southwestern states).

A comparison of the accompanying table on depth classification with that of 1950's completions shows that despite increased drilling activity the number of wells drilled to depths less than 2,500 ft. dropped from 15,764 in 1950 to 14,738 in 1951, down 6.5 per cent. All other classes are up: 2,500-5,000-ft. class, up 6.7 per cent; 5,000-7,500-ft. class, up 8.3 per cent; 7,500-10,000-ft. class, up 15.3 per cent; 10,000-12,500-ft. class, up 11.8 per cent; and the over 12,500-ft. class, up 52.9 per cent.

WILDCAT COMPLETIONS BY STATES

	Comp.	Oil	Gas	Dry
Alabama	21	1	0	20
Arkansas	99	13	1	85
California	551	67	6	478
Colorado	143	9	6	128
Dakotas	13	1	0	12
Florida	2	0	0	2
Illinois	873	103	3	767
Indiana	559	64	3	492
Kansas	1,006	139	12	855
Kentucky	293	49	1	243
Louisiana	379	58	9	312
Northern	210	17	6	187
Southern	169	41	3	125
Maryland	45	0	28	17
Michigan	332	19	5	308
Mississippi	174	21	1	152
Missouri	9	0	0	9
Montana	50	1	0	49
Nebraska	134	12	3	119
New Mexico	105	22	4	79
New York	0	0	0	0
Ohio	35	1	7	27
Oklahoma	830	124	18	688
Pennsylvania	10	0	3	7
Texas	4,408	802	133	3,473
North Central (9)	862	178	4	680
West Central (7-B)	1,019	193	16	810
West (7-C & 8)	844	189	9	646
Panhandle (10)	36	2	0	34
Eastern (5 & 6)	255	20	2	233
Gulf Coast (2)	299	48	32	219
Gulf Coast (3)	363	71	30	262
Southwest (1)	249	29	6	214
Southwest (4)	481	72	34	375
Utah	32	2	1	29
West Virginia	17	0	11	6
Wyoming	141	21	2	118
Miscellaneous	41	2	2	37
Total 1951	10,302	1,531	259	8,512
Total 1950	8,554	1,293	221	7,040

DEVELOPMENT COMPLETIONS BY STATES

	Comp.	Oil	Gas	Dry
Alabama	29	16	0	13
Arkansas	330	222	9	99
California	1,810	1,668	34	108
Colorado	146	94	6	46
Dakotas	0	0	0	0
Florida	0	0	0	0
Illinois	1,551	815	7	729
Indiana	810	370	15	425
Kansas	3,495	2,038	384	1,093
Kentucky	1,016	475	154	387
Louisiana	1,861	1,160	167	534
Northern	1,039	618	134	287
Southern	822	542	33	247
Maryland	0	0	0	0
Michigan	414	204	15	195
Mississippi	201	116	8	77
Missouri	9	0	2	7
Montana	212	143	8	61
Nebraska	107	65	10	32
New Mexico	668	328	250	90
New York	627	320	0	307
Ohio	936	333	219	384
Oklahoma	4,796	2,985	247	1,564
Pennsylvania	1,728	776	236	716
Texas	12,247	9,284	593	2,370
North Central (9)	1,829	1,200	7	622
West Central (7-B)	1,307	853	23	431
West (7-C & 8)	4,269	3,864	16	389
Panhandle (10)	693	348	294	51
Eastern (5 & 6)	919	719	28	172
Gulf Coast (2)	476	288	71	117
Gulf Coast (3)	1,175	860	76	239
Southwest (1)	352	272	4	76
Southwest (4)	1,227	880	74	273
Utah	7	6	0	1
West Virginia	585	79	408	118
Wyoming	604	421	19	164
Miscellaneous	5	4	0	1
Total 1951	34,214	21,922	2,771	9,521
Total 1950	34,725	23,137	2,822	8,966

TOTAL COMPLETIONS BY MONTHS

Month—	Comp.	Oil	Gas	Dry	Footage
January	3,639	2,021	239	1,379	13,901,417
February	2,717	1,499	217	1,001	10,634,478
March	3,452	1,883	239	1,330	13,844,402
April	3,277	1,775	169	1,333	12,374,590
May	3,921	2,058	258	1,605	15,236,578
June	3,760	1,979	251	1,530	13,815,957
July	3,790	1,914	258	1,618	14,329,455
August	4,430	2,286	320	1,824	17,061,800
September	3,746	1,940	231	1,575	14,221,120
October	3,938	2,062	276	1,600	15,093,277
November	4,112	2,089	294	1,729	16,345,992
December	3,734	1,947	278	1,509	15,472,266
Total 1951	44,516	23,453	3,030	18,033	172,331,330

WILDCAT COMPLETIONS BY MONTHS

Month—	Comp.	Oil	Gas	Dry	Footage
January	731	110	17	604	2,937,475
February	538	75	14	449	2,298,905
March	761	136	28	597	3,426,503
April	723	97	16	610	2,969,216
May	952	162	26	764	3,957,508
June	826	120	17	689	3,301,506
July	919	127	25	767	3,844,884
August	1,078	167	25	886	4,555,638
September	982	147	21	814	4,057,043
October	866	118	16	732	3,662,722
November	995	127	29	839	4,329,982
December	931	145	25	761	4,228,051
Total 1951	10,302	1,531	259	8,512	43,569,443

DEVELOPMENT COMPLETIONS BY MONTHS

Month—	Comp.	Oil	Gas	Dry	Footage
January	2,908	1,911	222	775	10,963,942
February	2,179	1,424	203	552	8,335,571
March	2,691	1,747	211	733	10,417,899
April	2,554	1,678	153	723	9,405,374
May	2,969	1,896	232	841	11,279,070
June	2,934	1,859	234	841	10,514,451
July	2,871	1,787	233	851	10,484,571
August	3,352	2,119	295	938	12,506,162
September	2,764	1,793	210	761	10,164,077
October	3,072	1,944	260	868	11,430,555
November	3,117	1,962	265	890	12,016,010
December	2,803	1,802	253	748	11,244,205
Total 1951	34,214	21,922	2,771	9,521	128,761,887

SERVICE-WELL COMPLETIONS BY MONTHS

	Penna.	N. Y.	Other	U. S.
January	31	17	24	72
February	29	14	25	68
March	41	22	27	90
April	50	26	33	109
May	59	31	29	119
June	69	35	53	157
July	61	32	48	141
August	73	36	48	157
September	75	25	35	135
October	63	32	50	145
November	52	21	24	97
December	50	16	24	90
Total 1951	653	307	420	1,380

DISTILLATE-WELL COMPLETIONS BY MONTHS

	Tex.	La.	Other	U. S.
January	23	11	7	41
February	16	5	10	31
March	25	6	19	50
April	14	4	7	25
May	20	10	10	40
June	17	8	11	36
July	15	4	9	28
August	15	9	10	34
September	17	3	10	30
October	19	7	3	29
November	20	9	8	37
December	44	5	5	54
Total 1951	245	81	109	435

DEPTH CLASSIFICATIONS* BY MONTHS

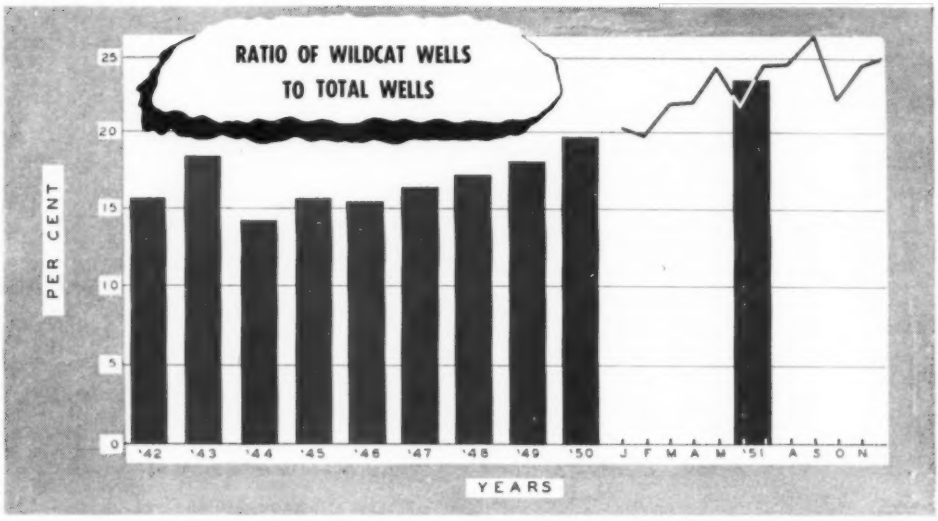
	A	B	C	D	E	F
January	1,185	1,570	600	201	75	8
February	849	1,170	459	146	78	15
March	1,075	1,446	568	228	118	17
April	1,132	1,342	534	171	82	16
May	1,274	1,661	615	244	105	22
June	1,341	1,559	572	200	76	12
July	1,292	1,583	608	203	88	16
August	1,483	1,826	752	245	99	25
September	1,338	1,480	594	230	79	25
October	1,373	1,579	633	240	88	25
November	1,296	1,723	701	268	98	26
December	1,100	1,516	727	262	96	33
Total 1951	14,738	18,455	7,363	2,638	1,082	240

*A: Under 2,500 ft.; B: 2,500-5,000 ft.; C: 5,000-7,500 ft.; D: 7,500-10,000 ft.; E: 10,000-12,500 ft.; F: Over 12,500 ft.

Total Footage Drilled in United States by Years

(Thousands of feet)

	1944	1945	1946	1947	1948	1949	1950	1951
Arkansas	1,190	828	728	1,409	1,270	1,283	1,342	1,522
California	7,527	8,671	7,509	8,764	10,579	10,443	7,966	9,566
Colorado	207	352	1,063	1,151	1,228	359	409	1,425
Illinois	4,958	4,565	5,925	5,251	6,386	6,362	6,311	6,044
Indiana	581	500	1,071	1,206	2,023	2,357	2,642	2,455
Kansas	6,194	5,877	6,556	8,690	10,634	10,715	12,744	15,035
Kentucky	1,863	1,275	1,175	1,194	1,515	1,853	2,076	2,412
Louisiana	5,723	7,774	8,464	8,709	10,934	12,477	14,554	14,189
Northern	1,408	2,117	3,175	2,912	4,128	4,453	4,626	4,741
Southern	4,315	5,657	5,289	5,797	6,806	8,024	9,928	9,448
Michigan	1,620	1,963	1,749	1,935	1,983	2,209	2,118	1,860
Mississippi	776	2,403	1,971	4,131	3,312	2,388	2,258	2,539
Montana	946	754	661	630	819	650	621	640
New Mexico	1,322	1,508	1,624	2,512	2,602	2,419	2,747	3,777
New York, Pennsylvania, West Va.	10,038	10,225	9,985	9,702	9,293	5,835	5,381	5,800
Ohio	2,730	2,689	3,402	3,913	3,498	2,286	2,172	2,057
Oklahoma	7,172	10,048	9,771	12,151	15,515	15,339	19,865	20,542
Texas	26,621	32,495	34,352	41,029	52,746	57,462	71,975	76,777
North Central	4,395	5,864	7,065	8,544	11,312	12,831	14,513	16,017
West	7,572	8,497	8,815	10,809	15,428	16,398	26,543	28,233
Panhandle	984	1,686	943	1,593	2,053	3,015	2,804	2,307
Eastern	1,867	2,504	3,792	3,070	3,383	4,992	4,928	5,603
Gulf Coast	9,491	11,690	11,599	9,559	11,995	11,880	13,706	14,328
Southwest	2,312	2,254	2,138	7,454	8,575	8,346	9,481	10,289
Wyoming	907	967	716	1,203	2,501	2,803	2,994	3,789
Miscellaneous	371	346	334	481	554	763	1,113	1,902
Total United States	80,746	93,240	97,058	114,061	137,392	138,003	159,288	172,331



10,302 Holes Punched to Find New Oil

New record for exploratory drilling established, both in number and footage

by Neil Williams

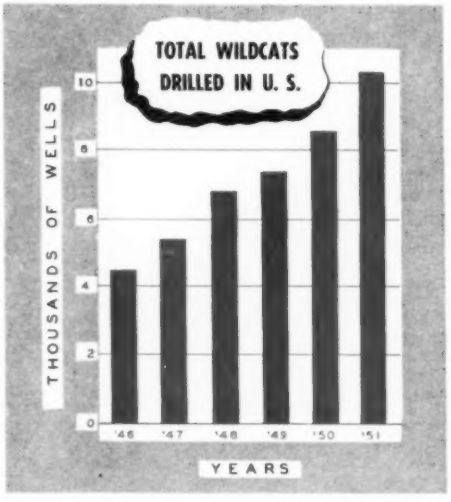
INDICATIVE of the intensified effort being made by the petroleum industry to find additional oil and gas reserves, exploratory drilling during 1951 was expanded to new record levels. Not only was there an outstanding increase during the year in the number of wildcat wells completed, but the ratio of wildcat drilling to field development operations, also at record levels, rose appreciably.

Accompanying tabulations reveal that 10,302 exploratory wells were drilled during 1951, an increase of 1,748, or 20.4 per cent over the 8,554-well record established the previous year. That number was 23.1 per cent of all wells, wildcat and field development, drilled. During the previous year, wildcat wells comprised only 19.9 per cent of all wells drilled.

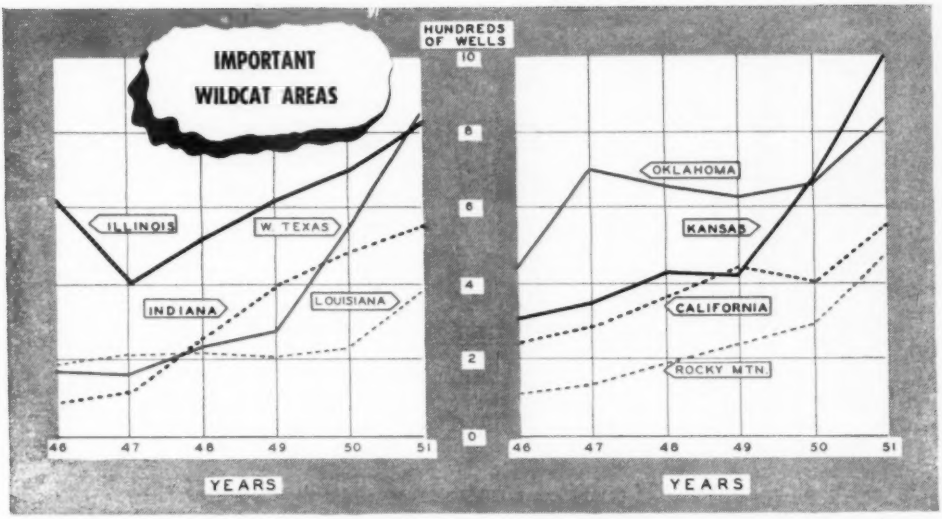
With the additional wildcat wells there also was a substantial increase in total footage drilled in exploratory work. This reached a record-breaking aggregate of 43,569,443 ft., as compared with the 1950 record footage of wildcat wells of 34,152,381 ft., an increase of 9,417,062 ft., or more than 27.5 per cent.

The large increase in footage drilled was not due entirely to the additional number of wells, however, but also to the fact that the average depth of the wells was slightly greater than that of the wells drilled during the previous year. The average depth of the 1951 wells was 4,229 ft., 236 ft. deeper than the average of 3,993 ft. in 1950.

Of the total wildcat wells drilled during the year, 1,790 were completed as oil and/or gas producers as compared with 1,514 successful wells completed during 1950, an increase of 276. These included not only those which discovered entirely new fields, but also those which opened new productive horizons in or extended productive areas of existing fields. Of the successful wildcats, 1,531 were classified as oil wells, 238 more than during the previous year. Wildcat gas wells completed totaled 259 or 38 more than during 1950.



Despite the substantial increase in number of successful wildcat wells completed, the ratio of these wells to total exploratory drilled remained



virtually unchanged during the year. The 1951 success ratio figured 17.3 per cent while that of 1950 was 17.7 per cent, representing only a fractional decline. This fractional decline follows a trend that has been apparent for several years.

Texas again led all states in number of exploratory wells drilled, its total being 4,408, an increase of 965, or 28 per cent over the 1950 total. Oklahoma, however, which was second during 1950, and which showed a small decline in wildcat drilling, was replaced by Kansas, which previously was third. Kansas wildcats drilled during 1951 totaled 1,006, an increase of 190, or 23.3 per cent. The Oklahoma total for the year was 830, a loss of 10.

Percentagewise, Colorado showed by far the greatest increase in wildcatting. Although its wildcats totaled only 143, they represented an increase of 87, or 155.3 per cent. Kentucky was second with an increase of 36.9 per cent, its total being 293 as compared with 79 during 1950.

Louisiana had the greatest average wildcat-well depth. The average depth of wildcat wells drilled in that state was 7,749 ft. In the Gulf Coast sector alone it was 10,685 ft., but the shallower drilling in the northern part of the state brought down the over-all average. Mississippi was second with an average well depth of 7,322 ft.

Amerada Petroleum Corp.'s successful rank wildcat in Williams County, North Dakota, the discovery well of Beaver Lodge-Madison field, was responsible for more general excitement than any other. The oil recovered from this well on initial tests served the needed proof that the big (100,000 sq. miles) Williston basin would be an oil-producing province to start the major leasing and rank wildcat drilling campaign of the year.

Exploratory drilling coupled with review of logs on prior-year wildcats resulted in the recognition of the potentialities of the Spraberry sandstone of West Texas' Midland basin.

Wildcat wells continued to expand the productive limits of the Julesburg basin in both northeastern Colorado and southwestern Nebraska. In Wyoming, particularly in the Powder River and Big Horn basins, wildcat wells were most successful in finding reserves in new areas and in new horizons in areas under development.

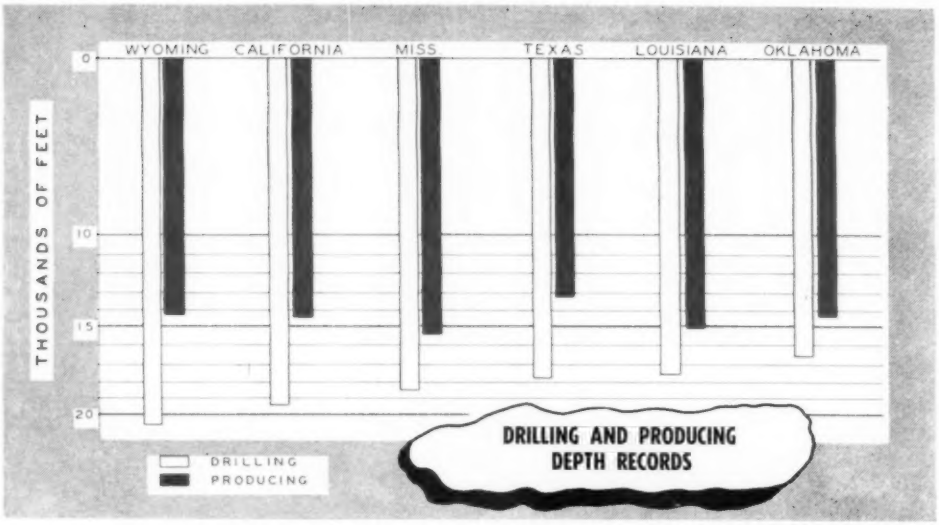
At the end of the year, scientifically located wildcats were drilling in Nevada, Idaho, Arizona, and South Dakota.

U. S. EXPLORATION RESULTS IN 1951

State—	Total wildcats	Per cent— Oil	Gas	Dry
Texas	4,408	18.2	3.0	78.8
Kansas	1,006	13.8	1.0	85.2
Illinois	873	11.7	0.3	88.0
Oklahoma	830	14.9	2.2	82.9
Indiana	559	11.4	0.5	88.1
California	551	12.1	0.1	87.8
Louisiana	379	15.3	2.3	82.4
Michigan	332	5.7	1.5	92.8
Kentucky	293	16.7	0.3	83.0
Mississippi	174	12.0	0.5	87.5
Colorado	143	6.2	4.1	89.7
Wyoming	141	14.8	1.4	83.8
All others	613	8.9	10.0	81.1
Total U. S.	10,302	14.8	2.5	82.7
Total 1950	8,554	15.1	2.6	82.3
Total 1949	7,294	14.9	2.7	82.4
Total 1948	6,877	15.0	3.6	81.4

WILDCAT FOOTAGE DRILLED IN STATES WITH GREATEST WILDCAT ACTIVITY
(Thousands of feet)

State—	1951	1950	1949
Texas	21,130	15,888	13,108
Kansas	3,659	2,859	1,782
Oklahoma	3,523	3,308	3,216
Louisiana	2,937	2,423	2,335
California	2,306	1,763	1,899
Illinois	2,148	1,834	1,584
Mississippi	1,274	974	810
Indiana	1,000	1,016	904
Michigan	777	797	747
Colorado	735	236	195
Wyoming	696	596	692
Kentucky	610	447	322
All others	2,774	2,011	1,689
Total United States	43,569	34,152	29,283



Trend Toward Deeper Drilling Continues

Wells drilled below 12,500 ft. show 52.9 per cent gain during year just closed

by Henry D. Ralph

DEPTH records hold a special interest to oil men, quite apart from their significance in indicating the constant trend toward deeper drilling and producing. So again the Journal presents its annual compilation showing the deepest hole and the deepest production in each state or area.

But we also have figures showing that deep drilling is becoming more and more common. Some of these are shown in the small table on this page which gives the wells drilled below 12,500 ft. during the past 3 years.

How deep must a well go before it is classed as a "deep" well? There is no hard and fast, generally accepted definition. What is deep for one area or one operator is shallow for another; and today it is routine to drill to a footage which would have been considered phenomenally deep a decade ago. But most oil men consider 10,000 ft. pretty deep and 12,500 ft. very deep, and a few comparisons in these brackets show the trend.

There were 1,041 wells drilled below 10,000 ft. in 1949, 1,225 in 1950, and 1,322 in 1951. This is still a relatively small fraction of all wells drilled, but the relationship of deep wells to total wells is increasing. In 1950, total wells increased 10.9 per cent over the previous year, while wells between 10,000 and 12,500 ft. increased only 7.1 per cent, but wells deeper than 12,500 ft. increased 14.6 per cent. In 1951 the total number of wells increased 2.9 per cent while wells between 10,000 and 12,500 ft. increased 11.8 per cent and those deeper than 12,500 ft. increased 52.9 per cent. The little table on this page shows the locations of the very deep wells.

The trend shows up at the other end of the scale, too. Between 1949 and 1950 the number of wells completed at less than 2,500 ft. showed a negligible percentage increase, but the figure dropped 6.5 per cent from 1950 to 1951. (The 1951 completions by depth brackets are given on page 209.) Approximately three-quarters of all wells drilled were bottomed at 5,000 ft. or less.

On the opposite page are the depth records by states. Some of them are of long standing, but new drilling depths were reached in 1951 in Southwest Texas, West Texas, Pennsylvania, South Dakota, and Nebraska. New records for deep production were established last year in Alabama, Arkansas, Kansas, Mississippi, Montana, Nebraska, Southeast New Mexico, South Louisiana, Southwest Texas, West Texas, North Dakota, and Washington—the last two representing the first and only commercial production to date.

WELLS DRILLED BELOW 12,500 FEET

	1951	1950	1949
Alabama	0	1	1
California	22	21	22
Colorado	0	0	1
Florida	1	0	0
Idaho	1	0	0
Louisiana, South	107	71	80
Mississippi	4	1	0
New Mexico	20	7	10
North Dakota	0	1	0
Oklahoma	5	4	5
Texas:			
Gulf Coast (Dist. 3)	7	6	7
Southwest (Dist. 4)	3	1	3
West (Dist. 7-C & 8)	64	37	12
Eastern (Dist. 5 & 6)	2	1	2
Panhandle (Dist. 10)	0	0	1
Utah	1	0	1
Wyoming	3	6	12
Total	240	157	127

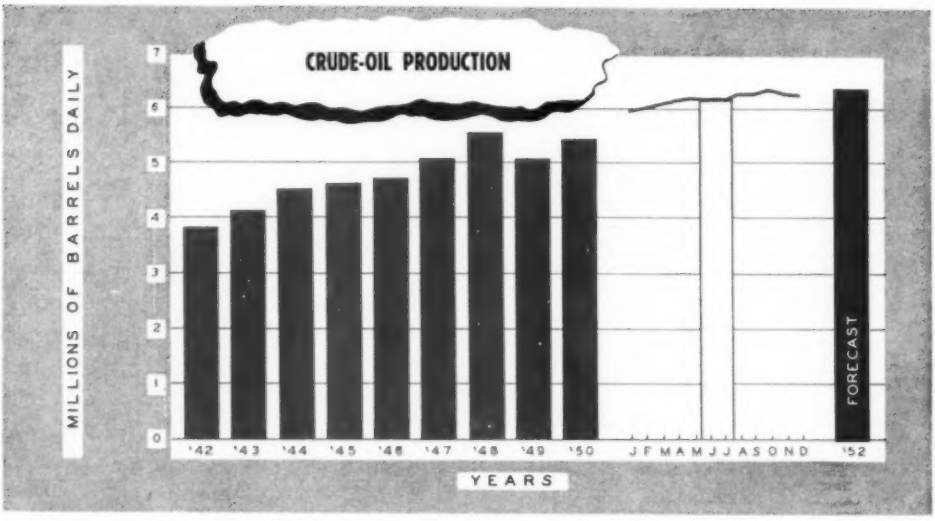
United States Drilling Depth Records

State or area—	Well and location; county	Result	Year comp.	Deepest formation	Total footage
Wyoming	Superior 1 Unit, 27-27n-103w; Sublette	Dry	1949	U. Cretaceous	20,521
Mississippi	Vasen 1 Fee, 9-2s-11w; Stone	Stdg.		Jurassic?	19,500
California	Superior 1 Limoneira, 9-2n-22w; Ventura	Dry	1949	U. Miocene	18,734
Texas, Southwest	Superior 27 Minnie S. Welder, Portilla field; San Patricio	Oil	1951		17,966
Louisiana, South	Magnolia 1-D Ragley Lumber Co., 29-5s-7w; Beauregard	Drlg.			17,836
Oklahoma	Superior 51-11 Weller, 11-8n-12w; Caddo	Dry	1947	Pennsylvanian	17,823
Texas Gulf Coast	Phillips 3 Schoeps, Millican salt dome; Brazos	Dry	1945	Cretaceous	16,655
Texas, East	Humble 1 McWatters; Freestone	Oil	1949	Smackover	16,347
Alabama	Humble 2 Williams, 21-6n-4w; Washington	Dry	1949		15,659
Texas, West	Gulf Oil Corp. 1 Winfield, 3-132-T&StL.; Pecos	Dry	1951		15,468
Florida	Gulf 1 State; Monroe	Dry	1947		15,155
Colorado	Mountain Fuel 1 Hiawatha, 14-12n-100w; Moffat	Tstg.			15,041
New Mexico, Southeast	Humble 1 Federal-Wiggs, 31-24s-27e; Eddy	Dry	1950	Ellenburger	14,885
Texas, Panhandle	Gulf 1-E Porter "A," 413-43-H&TC; Lipscomb	Dry	1949	Ellenburger	14,278
Utah	Equity & Pacific Western 1 Unit, 33-21s-21e; Grand	Dry	1949	Pennsylvanian	13,767
Louisiana, North	Union 1 McDonald Unit; Claiborne	Oil	1942	Smackover	12,952
Idaho	Phillips & Utah Southern 1 Juniper, 10-14s-30e; Oneida	Drlg.			12,844
North Dakota	Kelly & Plymouth 1 Leutz, 28-142n-89w; Mercer	Dry	1950	Ordovician	12,526
Pennsylvania	The California Co. 1 Bennett; Sullivan	Dry	1951	Siluro-Ord.	12,321
Montana	Shell 1 Crow Tribal, 36-9s-37e; Big Horn	Dry	1949	Charles	11,519
Arkansas	Stanolind 1 Bodcaw, 29-19s-23w; Lafayette	Dry	1948	Smackover	11,434
Michigan	Ohio and Pure 1 Reinhardt, 35-22n-2e; Ogemaw	Dry	1948	Cambro-Ord.	11,012
Washington	Standard of California 1 Alderwood; Snohomish	Dry	1947		11,002
Nevada	Continental and Standard of Calif. 1 Meridian, 31-16n-56e, White River	Dry	1950	Ordovician	10,311
North Carolina	Standard (N. J.) 1 Hatteras Light; Dare	Dry	1946	Granite	10,054
West Virginia	Hope Natural Gas 8517 Gribble, Grant dist.; Harrison	Dry	1941	Queenston	10,018
New Mexico, Northwest	Southern Union 9 Barker Creek, 21-32n-14w; San Juan	Gas	1945	Pennsylvanian	9,468
South Dakota	Shell 1 Homme, 13-20n-12e; Perkins	Dry	1951	Granite	9,348
Oregon	Texas 1 Cooper Mountain, 25-1s-2w, Washington	Dry	1946		9,263
Texas, North	Standard of Texas 2 Beasley, McKerley Sur.; Cooke	Oil	1946	Ellenburger	9,158
New York	N. Y. State Natural Gas 1 Kesselring, Van Etten Twp.; Chemung	Drlg.		Trenton?	8,843
Kansas	Stanolind 1 Feathers, 15-35s-33w; Seward	Gas	1947	Crystalline	8,243
Maryland	Snee 1 Schartzer; Garrett	Dry	1941	Helderberg	8,185
Nebraska	Gulf 1 Miller, 7-12n-58w; Kimball	Tstg.	1951	Morrison	7,999
Ohio	Ohio 1-C Knowlton, Sec. 10, Indep. Twp.; Washinigon	Dry	1933	Silurian	7,889
Georgia	Stanolind on land lot 133, Land dist. 10; Mitchell	Dry	1944	Triassic	7,487
Illinois	Pure 3 Billington, 26-1n-7e; Wayne	Dry	1940	St. Peter	7,207
Arizona	Waddell-Duncan 1 McComb, 23-13s-24e; Cochise	Dry	1950		6,865
Kentucky	Pure & Ashland 1-A Walker, 22-N-24; Webster	Dry	1949	Knox	6,688
Indiana	Continental 1 Cooper est., 13-3s-14w; Gibson	Dry	1947	Trenton	6,405
Tennessee	California 1 Beeler; Giles	Dry	1947	Granite	5,750
Iowa	Oil Development 1 Wilson; Page	Dry	1930	Cambrian	5,305
New Jersey	W. & K. 1 Mathews, Jackson Mills; Ocean	Dry	1929	Wissahickon	5,022
Missouri	Strake 1 Russell, 24-19n-11e; Pemiscot	Dry	1941	Cambrian	4,740
South Carolina	Parris Island water supply well; Beaufort	Dry	1940	Crystalline	3,454

United States Producing Depth Records

State or area—	Well and location; county	Result	Year comp.	Prod. formation	Prod. depth
Alabama	Humble 1 Oswell, 15-3n-2n; Baldwin	Oil	1951	Tuscaloosa	5,425
Arkansas	Atlantic 11 Bodcaw, McKamie-Patton field; Lafayette	Cond.	1951	Smackover	9,335
California	Standard of California 5 Mushrush, 7-27s-24e; Kern	Oil	1949	Eocene	15,530
Colorado	Delhi-El Paso 5 Barker, 2-32n-14w; La Plata	Gas	1950	Paradox	9,841
Florida	Humble 1 Gulf Coast, Sunniland field; Collier	Oil*	1943	Glen Rose	†11,626
Illinois	Kingwood 24-A Shanafelt, 20-2n-2e; Marion	Oil	1943	Trenton	4,657
Indiana	Lewis 1 Hill, 35-3s-14w; Posey	Oil	1939	McClosky	3,144
Kansas	Stanolind 1 Wall, 35-32s-23w; Clark	Oil	1951	Viola	6,576
Kentucky	United Carbon 1 Howe; Pike	Gas	1932	Devonian	5,170
Louisiana, North	James & Co. 2 Williamson, 28-23n-8w; Claiborne	Oil	1948	Smackover	10,789
South	Shell 1 Gonsulin, 41-14s-7e; Iberia	Oil	1951	Miocene	15,336
Maryland	Cumberland-Allegheny S-424 Beachy, Ryans Glade 8 dist.; Garrett	Gas	1949		4,456
Michigan	Michigan Gulf 1 Bateson, Kawkawlin field; Bay	Oil*	1946	Salina	7,850
Mississippi	Union Producing et al 1 Logan, Tinsley field; Yazoo	Cond.	1951	Smackover	14,427
Missouri	Cities Service 1 Cook, Tarkio field; Atchison	Oil	1944	Bartlesville	1,444
Montana	Texas 1 Northern Pacific, 35-15n-54e; Dawson	Oil	1951	Devonian?	9,079
Nebraska	Gulf 1 Sisson, 18-21n-58w; Kimball	Oil	1951	Dakota	7,431
New Mexico, Northwest	Southern Union 9 Barker Creek, 21-32n-14w; San Juan	Gas	1945	Pennsylvanian	9,468
Southeast	Phillips 3-A Denton, 11-15s-37e; Lea	Oil	1951	Devonian	12,766
New York	Kane 1 Lewis, West Union Twp.; Steuben	Gas	1942	Oriskany	5,228
North Dakota	Amerada 1 Iverson, 6-115n-95w; Williams	Oil	1951	Madison	8,528
Ohio	East Ohio 1 Phillips, Sec. 23, Washington Twp.; Harrison	Gas	1941	Silurian	†5,899
Oklahoma	Denver 1 School Land, 16-10n-9w, Cogar field; Caddo	Gas	1948	Hunton	14,510
Pennsylvania	American Locomotive 5 Steiner, Unity Twp.; Westmoreland	Gas	1946	Oriskany	8,014
Tennessee	York 2 Print Huff; Pickett	Oil	1947	Knox	1,702
Texas, East	Humble 1 Curtis, Larissa field, Cherokee	Oil	1942	Petlit	10,312
Gulf Coast	Meredith et al 1 Hankamer, W. Hamshire field, Jefferson	Cond.	1950		11,490
North	Standard of Texas 2 Beasley, McKerley Sur.; Cooke	Oil	1946	Ellenburger	8,940
Panhandle	Sinclair 1 Lips, 135-C-G&M Sur.; Roberts	Oil	1949	Mississippian	9,050
Southwest	Western Natural Gas 14 St. Charles Ranch, Blackjack field; Aransas	Gas	1951		11,490
West	Magnolia 7 Wilson, 42-40-T&P; Upton	Oil	1951	Ellenburger	13,400
Utah	Carter-Stanolind 1 Ute-Tribal, 21-1s-1e (USM); Uintah	Oil	1949	Green River	†9,390
Washington	Hawksworth et al 4 State, 15-18n-12w; Grays Harbor	Cond.	1951	Miocene	3,714
West Virginia	Ohio 1 Kendall et al, Dry Fork dist.; Tucker	Gas	1946	Oriskany	†8,410
Wyoming	Pure 1 Unit, 11-33n-84w; Natrona	Oil	1948	Frontier	14,907

*Now abandoned. †Total depth figure.



Crude Production Increase Largest in History

Texas passes billion-barrel mark for first time; other states set new highs

by Philip C. Ingalls

PRODUCTION of crude in 1951 not only established a new all-time high for total volume but also set a new record with the largest annual increase in history.

Total crude for the year amounted to 2,242,698,000 bbl. or 6,144,000 bbl. daily for an increase of 745,000 bbl. daily or 13.8 per cent. Figures on crude throughout this article include field condensate.

The size of the increase can be pictured by comparing it with production in known areas. Only two states, Texas and California, produced more crude than the over-all increase in production for the year. The gain was slightly greater than the combined production in Louisiana and Mississippi.

Along with the other records for the year, 13 individual states reached new all-time production highs in 1951. Texas passed the billion-barrel mark for the first time.

Daily average production exceeded 6,000,000 bbl. daily for each month of the year after February, reaching a peak of 6,375,000 bbl. daily in October.

Trends in Texas Allowables

Production allowables in Texas were raised in each of the first 5 months of the year, followed by a small reduction for June. News of the shutdown in Iran raised fears of a possible world-wide shortage. The number of producing days in Texas was unchanged from July to August, but new production gave a small boost to total allowable. Production increases in September and October resulted in such large additions to inventories that allowables were cut for the last 2 months of the year.

In addition to 1951 crude requirements to meet an abnormal increase in domestic demand for petroleum products, two major factors influenced production during the year. There were the adjustments in world supply necessitated by the loss of the producing and refining capacity in Iran and the need for larger working inventories of both crude and products in this country.

Production in Iran was in excess of 700,000 bbl. daily in the early months of 1951. The loss of this amount of production in the world supply program called for decided increases in other crude producing areas. The oil industry of this country contributed to the solution of the problem by increasing product exports and cutting back on imports. Product exports for the year were about 65 per cent greater than in 1950. Product imports dropped about 3.5 per cent.

Inventory Building Boosts Production

This reversal of the import-export trend required greater increases in refinery runs of crude, and the increase in crude demand had to be met by expanded domestic crude production.

Crude and product stocks increased about 30,500,000 bbl. in 1951 or at the rate of 83,500 bbl. daily. Since there was no appreciable increase in total imports, this inventory building boosted crude production. Out of the total increase in crude production of 745,000 bbl. daily, 11.2 per cent went to crude or product storage.

Most forecasts of supply and demand for 1952 are based on little change in total inventory levels from the end of 1951 to the end of 1952. Therefore, crude production, just large enough to meet export and refinery demands in 1952, will be compared with production for demands plus stock building in 1951. Also, imports are expected to supply a slightly larger

United States Production of Crude Oil—by States—1945-1951

(Thousands of barrels)

	1951 Prod. change	1951	1950	1949	1948	1947	1946	1945	Cum. prod. 1857-1951
Alabama	+ 296	1,031	735	462	466	396	380	181	3,705
Arkansas	— 1,539	29,569	31,108	29,986	31,682	29,948	28,375	28,613	846,472
California	+ 27,392	355,019	327,627	332,942	340,074	333,132	314,713	326,482	9,011,947
Colorado	+ 4,205	27,558	23,353	23,587	17,862	15,702	11,856	4,959	174,887
Florida	+ 110	597	487	441	290	259	68	30	2,184
Illinois	— 2,095	59,827	61,922	64,501	64,808	66,459	75,297	75,210	1,553,795
Indiana	+ 1,133	11,075	9,942	9,696	6,974	6,095	6,726	4,868	210,868
Kansas*	+ 6,523	114,118	107,595	100,230	108,119	105,187	97,281	96,041	2,200,285
Kentucky†	+ 1,205	11,526	10,321	8,821	8,820	9,405	10,590	10,325	263,869
Louisiana	+ 23,323	232,439	209,116	190,826	181,458	160,128	143,669	130,566	2,834,088
Michigan	— 1,900	13,911	15,811	16,517	16,871	16,215	17,074	17,259	335,987
Mississippi	— 1,020	37,238	38,258	37,966	45,761	34,925	24,298	18,775	321,424
Montana	+ 879	8,991	8,112	9,118	9,382	8,742	8,825	8,397	177,439
Nebraska	+ 999	2,546	1,547	330	215	229	279	318	9,964
New Mexico	+ 4,728	52,729	48,001	47,645	47,969	40,926	36,814	37,281	734,679
New York	+ 104	4,247	4,143	4,425	4,621	4,762	4,863	4,648	180,326
North Dakota	+ 23	23							23
Ohio	— 250	3,083	3,333	3,483	3,600	3,108	2,908	2,828	620,646
Oklahoma	+ 23,058	186,866	163,808	150,804	155,231	141,019	134,794	138,036	6,384,600
Pennsylvania	— 454	11,358	11,812	11,374	12,667	12,690	12,996	12,515	1,148,117
Texas	+ 177,009	1,006,240	829,231	744,834	903,498	820,210	760,215	755,533	14,783,210
Utah	+ 102	1,310	1,208	637	16				3,171
Virginia	— 8	12	20	43	33	61	12	4	188
West Virginia	— 79	2,709	2,788	2,839	2,692	2,617	2,929	2,875	446,318
Wyoming	+ 8,219	68,676	60,457	47,890	55,032	44,772	38,977	35,359	984,086
Total U. S.	+ 271,963	2,242,698	1,970,735	1,839,397	2,018,141	1,856,987	1,733,939	1,711,103	43,232,278
Daily average	+ 745	6,144	5,399	5,039	5,514	5,088	4,751	4,688	

*Includes Missouri. †Includes Tennessee.

portion of total demand in 1952. These changes account for a projected increase of about 4.7 per cent crude production compared with an increase of 6.3 per cent in total demand.

There was no general crude price change in 1951. Price ceilings were adjusted in a few fields where prices were out of line because of gathering and transportation costs.

CRUDE-OIL PRODUCTION RECORDS BY STATES

(Thousands of barrels)

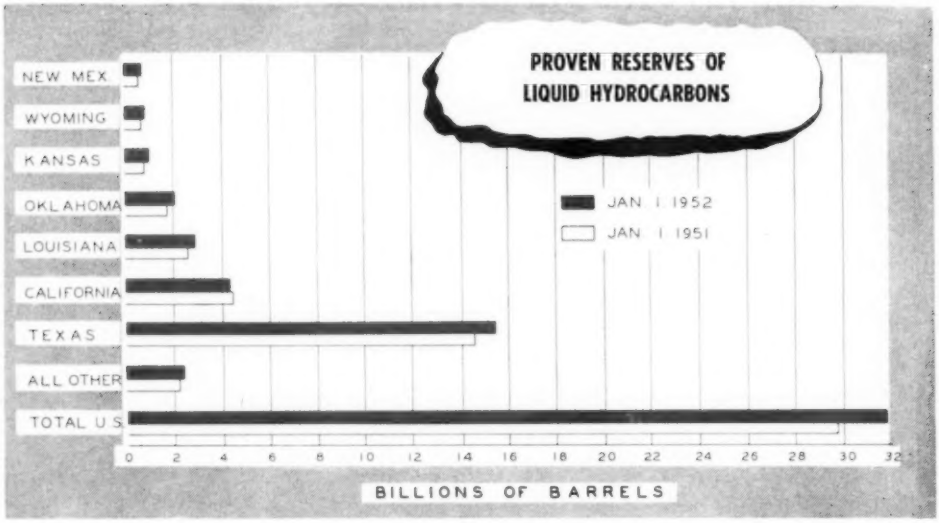
	Record year		Production in record year
Alabama	1951		1,031
Arkansas		1925	77,398
California	1951		355,019
Colorado	1951		27,558
Florida	1951		597
Illinois		1940	147,647
Indiana		1904	11,339
Kansas*	1951		114,118
Kentucky†	1951		11,526
Louisiana	1951		232,439
Michigan		1939	23,462
Mississippi		1948	45,761
Montana		1948	9,382
Nebraska	1951		2,546
New Mexico	1951		52,729
New York		1882	6,685
North Dakota	1951		23
Ohio		1896	23,941
Oklahoma		1927	277,775
Pennsylvania		1891	31,424
Texas	1951		1,006,240
Utah	1951		1,310
Virginia		1947	61
West Virginia		1900	16,196
Wyoming	1951		68,676

*Includes Missouri. †Includes Tennessee.

PRODUCTION—DAILY AVERAGE PER WELL

	Bbl. daily 1951	Producing wells 1-1-52	Daily avg. per well
Alabama	2,820	74	38.1
Arkansas	81,010	3,749	21.6
California	972,650	30,227	32.2
Colorado	75,500	852	88.6
Florida	1,630	12	135.8
Illinois	163,910	33,247	4.9
Indiana	30,340	4,231	7.2
Kansas	312,570	31,273	10.0
Kentucky	31,540	15,515	2.0
Louisiana	636,820	12,879	49.4
Michigan	38,110	3,904	9.8
Mississippi	102,020	1,480	68.9
Montana	24,630	3,179	7.7
Nebraska	6,980	182	38.4
New Mexico	144,460	6,104	23.7
New York	11,640	17,100	0.7
North Dakota*	60	1	60.0
Ohio	8,450	18,900	0.4
Oklahoma	511,960	58,612	8.7
Pennsylvania	31,120	55,900	0.6
Texas	2,756,820	129,959	21.2
Utah	3,590	41	87.6
West Virginia	7,420	14,800	0.5
Wyoming	188,150	5,597	33.6
Miscellaneous	150	160	0.9
Total U. S.	6,144,350	447,978	13.7

*Less than full year of production.



Total Reserves Near 32 Billion Barrels

Despite record withdrawals, nation's stockpile up nearly 2 billion barrels

by Philip C. Ingalls

ONCE again, despite record withdrawals, estimates of proven reserves of crude oil and natural-gas liquids in the United States were higher at the beginning of the current year than at the beginning of the previous year.

Estimates of total liquid hydrocarbons (crude oil and natural-gas liquids) considered recoverable from known reservoirs, developed or being developed by methods currently in use, increased 1,844 million barrels. This increase resulted in an estimate of 31,796,000,000 bbl. for the beginning of this year against 29,952,000,000 bbl. booked for the first of 1951.

This increase is due principally to the fact that estimates of reserves for reservoirs discovered prior to 1951 have been revised upward as development of these fields has progressed and their performance showed that last year's estimates were conservative. This year's discoveries have been estimated conservatively; next year they will be among those that are revised upward.

These estimates do not include oil believed to be recoverable by fluid-injection methods unless those methods have been applied and definite results indicated. Neither do they include oil that may be produced by processing oil shales. Furthermore, these estimates are based on existing economic conditions.

Crude Oil

Known reserves of crude oil in the United States are estimated at 27,537,000,000 bbl., 1,416,000,000 bbl. more than estimated 1 year ago.

Texas played the biggest role in this increase by accounting for 608,000,000 bbl. Though 485,000,000 bbl. of that 608 million were credited to West Texas, estimates for the area's sprawling Spraberry were kept conservative because development has covered but a fraction of the area considered potentially productive and almost eligible for the "proved" category.

ESTIMATED PROVEN RESERVES OF TOTAL LIQUID HYDROCARBONS IN THE UNITED STATES
(Millions of barrels)

State—	Jan. 1, 1952	Jan. 1, 1951	Change
Arkansas	347	343	+ 4
California	4,347	4,445	— 98
Colorado	271	260	+ 11
Illinois	564	479	+ 85
Kansas-Missouri	1,060	890	+ 170
Kentucky	77	71	+ 6
Louisiana	2,940	2,635	+ 305
Michigan	91	77	+ 14
Mississippi	459	490	— 31
Montana	129	114	+ 15
New Mexico	720	695	+ 25
Oklahoma	2,010	1,786	+ 224
Pennsylvania	98	108	— 10
Texas	17,465	16,557	+ 908
West Virginia	79	78	+ 1
Wyoming	920	745	+ 175
Others	219	179	+ 40
Total United States	31,796	29,952	+1,844

DRY NATURAL GAS
(Billions of cubic feet)

Total United States	191,360	184,945	+6,415

Estimated Proven Reserves of Crude Oil in the United States

(Thousands of barrels)

State—	Proven reserves 1-1-51	Extensions 1951 discoveries	Extensions and revisions	1951 production	Proven reserves As of 1-1-52	Year's change	Per cent of U. S.
Alabama	5,000	0	31	1,031	4,000	— 1,000	
Arkansas	289,000	1,000	32,981	27,981	295,000	+ 6,000	1.1
California total	4,123,000	19,000	220,019	355,019	4,007,000	— 116,000	14.6
Coastal	700,000	3,000	129,652	72,652	760,000	+ 60,000	2.8
Los Angeles	1,245,000	7,000	50,764	125,764	1,177,000	— 68,000	4.3
San Joaquin	2,178,000	9,000	39,603	156,603	2,070,000	— 108,000	7.5
Colorado	245,000	5,000	32,558	27,558	255,000	+ 10,000	0.9
Florida	4,000	0	—403	597	3,000	— 1,000	
Illinois	453,000	8,000	136,827	59,827	538,000	+ 85,000	2.0
Indiana	50,000	5,000	14,075	11,075	58,000	+ 8,000	0.2
Kansas-Missouri	780,000	40,000	204,118	114,118	910,000	+ 130,000	3.3
Kentucky-Tennessee	58,000	3,000	15,526	11,526	65,000	+ 7,000	0.2
Louisiana total	2,035,000	65,000	430,977	220,977	2,310,000	+ 275,000	8.4
North	435,000	5,000	31,119	41,119	430,000	— 5,000	1.6
South	1,600,000	60,000	399,858	179,858	1,880,000	+ 280,000	6.8
Michigan	76,000	1,000	26,911	13,911	90,000	+ 14,000	0.3
Mississippi	435,000	3,000	2,287	35,287	405,000	— 30,000	1.5
Montana	110,000	5,000	18,991	8,991	125,000	+ 15,000	0.5
Nebraska	10,000	6,000	4,546	2,546	18,000	+ 8,000	0.1
New Mexico	610,000	10,000	57,624	52,624	625,000	+ 15,000	2.3
New York	59,000	0	2,247	4,247	57,000	— 2,000	0.2
North Dakota	0	20,023	0	23	20,000	+ 20,000	0.1
Ohio	27,000	0	3,083	3,083	27,000	0	0.1
Oklahoma	1,536,000	50,000	335,866	186,866	1,735,000	+ 199,000	6.3
Pennsylvania	106,000	0	1,358	11,358	96,000	— 10,000	0.3
Texas total	14,357,000	390,000	1,209,520	991,520	14,965,000	+ 608,000	54.3
East	3,150,000	10,000	130,403	160,403	3,130,000	— 20,000	11.4
Gulf Coast	3,195,000	50,000	205,549	230,549	3,220,000	+ 25,000	11.7
North	585,000	49,800	377,712	87,512	925,000	+340,000	3.3
Panhandle	287,000	200	63,864	31,064	320,000	+ 33,000	1.1
Southwest	1,740,000	80,000	—230,768	104,232	1,485,000	— 255,000	5.4
West	5,400,000	200,000	662,760	377,760	5,885,000	+ 485,000	21.4
Utah	20,000	9,000	2,310	1,310	30,000	+ 10,000	0.1
West Virginia-Virginia	38,000	0	3,721	2,721	39,000	+ 1,000	0.1
Wyoming	695,000	50,000	183,676	68,676	860,000	+165,000	3.1
Total United States	26,121,000	690,023	2,938,849	2,212,872	27,537,000	+1,416,000	100.0

Estimated Proven Reserves of Natural-Gas Liquids in the United States

Includes Condensate, Natural Gasoline, and Liquefied Petroleum Gases

(Thousands of barrels)

State—	Proven reserves 1-1-51	Extensions 1951 discoveries	Extensions and revisions	1951 production	Proven reserves As of 1-1-52	Year's change	Per cent of U. S.
Arkansas	54,000	200	1,790	3,990	52,000	— 2,000	1.2
California	322,000	500	46,890	29,390	340,000	+ 18,000	8.0
Colorado	15,000	100	1,325	425	16,000	+ 1,000	0.4
Illinois	26,000	20	3,330	3,350	26,000	0	0.6
Kansas	110,000	800	43,275	4,075	150,000	+ 40,000	3.5
Kentucky	13,000	50	755	1,805	12,000	— 1,000	0.3
Louisiana	600,000	10,000	53,655	33,655	630,000	+ 30,000	14.8
Michigan	1,200	10	—30	80	1,100	— 100	
Mississippi	55,000	100	1,595	2,695	54,000	— 1,000	1.3
Montana	3,600	100	65	265	3,500	— 100	0.1
New Mexico	85,000	1,000	14,615	5,615	95,000	+ 10,000	2.2
Ohio	1,600	10	70	80	1,600	0	
Oklahoma	250,000	5,000	43,370	23,370	275,000	+ 25,000	6.5
Pennsylvania	2,500	30	170	200	2,500	0	
Texas	2,200,000	30,000	409,300	139,300	2,500,000	+300,000	58.8
West Virginia	40,000	100	6,065	6,165	40,000	0	0.9
Wyoming	50,000	500	11,895	2,395	60,000	+ 10,000	1.4
Others	2,600	75	—1,830	45	800	— 1,800	
Total United States	3,831,500	48,595	636,305	256,900	4,259,500	+428,000	100.0

ESTIMATED PROVEN RESERVES OF NATURAL GAS IN THE UNITED STATES

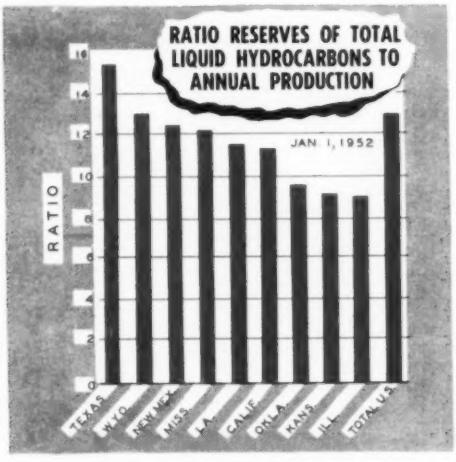
(Billion cubic feet at 60° F. and 14.65 psia.)

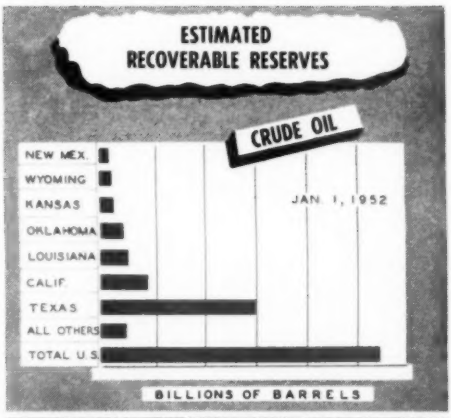
	1-1-52	1-1-51	Changes
Arkansas	900	860	+ 40
California	9,700	9,900	— 200
Colorado	1,300	1,200	+ 100
Illinois	225	220	+ 5
Indiana	30	25	+ 5
Kansas	15,000	15,000	
Kentucky	1,350	1,350	
Louisiana	28,000	26,000	+2,000
Michigan	200	200	
Mississippi	2,500	2,500	
Montana	800	850	— 50
New Mexico	7,500	6,500	+1,000
New York	65	65	
Ohio	640	640	
Oklahoma	12,000	11,900	+ 100
Pennsylvania	900	900	
Texas	106,000	103,000	+3,000
Utah	65	60	+ 5
West Virginia	1,700	1,750	— 50
Wyoming	2,400	2,000	+ 400
Others	85	25	+ 60
Total United States	191,360	184,945	+6,415

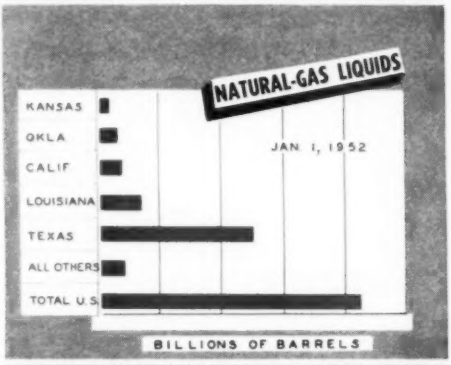
Louisiana's reserves increased 275,000,000 bbl. as a result of revisions to old fields and new discoveries in the southern portion of the state. Substantial revisions were made to many of the older fields in Oklahoma, particularly those in the south-central part of the state, to increase estimate 199,000,000 bbl. Estimated reserves for Wyoming were increased 165,000,000 bbl. with new discoveries accounting for a substantial portion of the increase. Kansas' reserves, long subject to conservative estimates by many, were increased 130,000,000 bbl. with many of the old fields being revised upward substantially and considerable weight given the new discoveries in the southwestern part of the state.

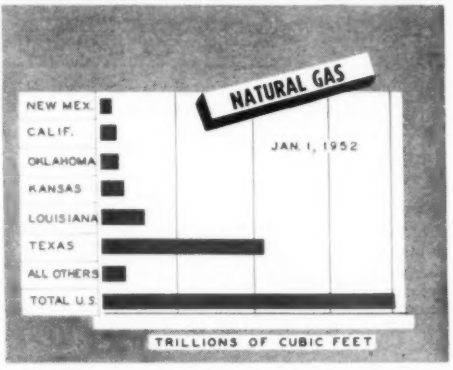
Natural-Gas Liquids

These figures are estimates of hydrocarbon liquids that are gaseous in the reservoir but are obtainable by condensation or absorption. They include condensate separated on the lease, at scrubbers, and at cycling and natural-gasoline plants. In addition, some allowance has been made for liquids considered available by processing still-greater quantities of the total wet gas now being produced.



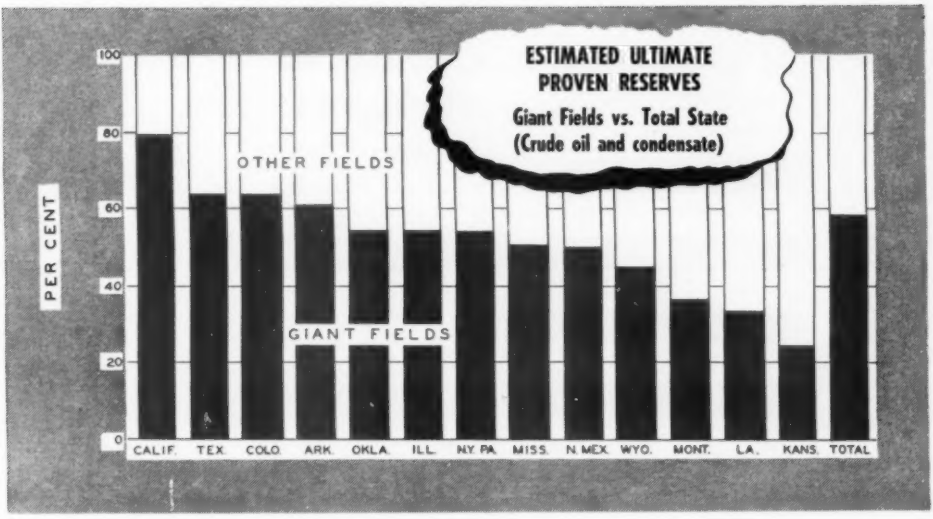






Recoverable reserves of natural-gas liquids in the United States are estimated at 4,259.5 million barrels. This is an increase of 428,000,000 bbl. over the estimates of 1 year ago.

Estimated remaining reserves of dry natural gas increased 6,415 billion cubic feet to a total of 191.4 trillion. Texas, Louisiana, Kansas, and Oklahoma continued to dominate the gas-reserve picture but development of reserves in Northwest New Mexico may soon push that state over the 10-trillion-cubic-foot mark.



Majority of Oil From But 151 Fields

These giant fields have yielded 58.5 per cent of all U. S. oil to date

OF the estimated 71.8 billion barrels of oil (crude and condensate) found in the United States to the end of 1951, 58 per cent of it can be credited to but 151 fields.

Here in self-explanatory tabular form are summaries of 1951 production and estimated ultimate production of those 151 fields which (1) accounted for 58.5 per cent of the 43.5 billion barrels of oil produced in this country to the end of 1951, (2) supplied 47.5 per cent of the 2.3 billion barrels of oil produced during 1951, and (3) contain 57.5 per cent of the estimated proven reserves of 28.3 billion barrels.

Beginning on page 264 of this issue are detailed the proved remaining reserves of crude oil and condensate of the country's larger producing fields. The giant fields, those with estimated ultimate recoveries of 100 million barrels or more, are denoted by asterisks. Six of the giant fields are not shown in this detailed tabulation as they are no longer carried as individual fields by the Texas Railroad Commission.

TOTAL OIL FOUND TO JANUARY 1, 1952. GIANT FIELDS* VS. ALL FIELDS
(Millions of barrels)

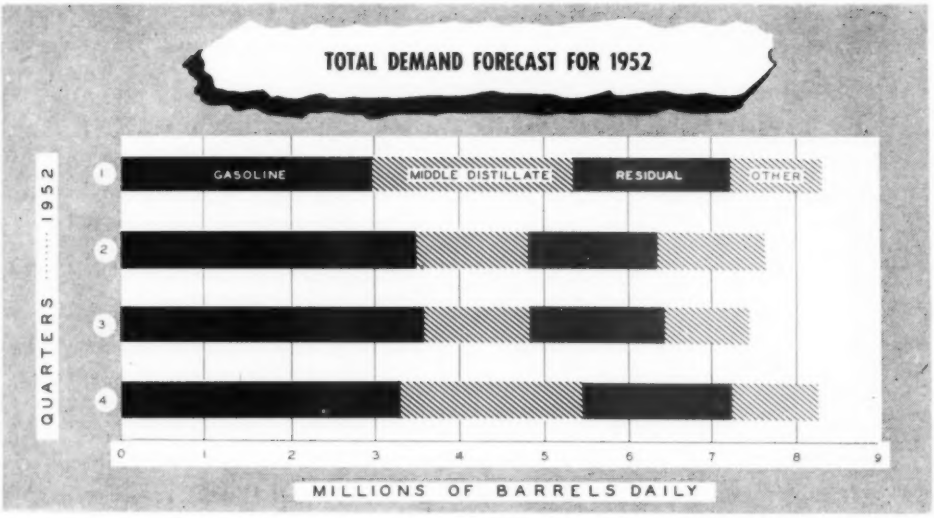
State—	No. of giants	Est. ultimate prod.† Giants	All fields	Giants' per cent
Texas	60	19,491	30,416	64.1
California	31	10,415	13,063	79.7
Oklahoma	21	4,409	8,123	54.3
Louisiana‡	13	1,752	5,443	32.2
Illinois	5	1,135	2,090	54.3
Wyoming	4	820	1,845	44.4
N. Y.-Pa.	2	803	1,481	54.2
Kansas	4	735	3,108	23.6
Arkansas§	3	700	1,155	60.6
New Mexico	3	675	1,359	50.0
Mississippi	3	390	775	50.3
Colorado	1	275	429	64.1
Montana	1	110	303	36.3
Other states	0	0	2,250	0
Total U. S.	151	41,710	71,840	58.1

*Fields with estimated ultimate production of 100 million barrels or more. †Accumulated production to January 1, 1952, plus estimated proven reserves of crude plus condensate. ‡Includes all of Rodessa. §Includes all of Elk Basin.

1951 PRODUCTION, GIANT* FIELDS VS. ALL FIELDS
(Thousands of barrels)

State—	No. of giants	Production† Giants	Total	Per cent from giants
Texas	60	542,265	1,034,811	52.4
California	31	249,060	357,490	69.7
Oklahoma	21	88,954	186,866	47.6
Louisiana‡	13	63,285	243,613	26.0
Kansas	4	22,164	114,087	19.4
Colorado	1	22,071	27,558	80.1
Illinois	5	20,028	59,827	33.5
New Mexico	3	19,835	52,475	37.8
Wyoming	4	18,708	69,276	27.0
N. Y.-Pa.	2	13,258	15,605	85.0
Mississippi	3	12,977	38,177	34.0
Arkansas§	3	10,739	29,569	36.3
Montana	1	2,883	8,991	32.1
Other states	0	0	47,823	0
Total U. S.	151	1,086,227	2,286,168	47.5

*Fields with estimated ultimate production of 100 million barrels or more. †Crude plus condensate. ‡Includes all of Rodessa. §Includes all of Elk Basin.



'52 Demand Set at 7,939,000 Bbl. Daily

Industry must operate at higher levels than ever before to meet soaring needs

by E. T. Knight*

IT is forecast that during 1952 the oil industry will be required to meet a total demand for petroleum and products equal to 7,939,300 bbl. daily, an increase over 1951 of 6.3 per cent. This damand is divided as follows:

1. Domestic demand 7,577,300 bbl. daily, an increase of 7.6 per cent.

2. Exports of crude and products 362,000 bbl. per day, a decrease of 14.9 per cent.

If these demands are realized, the United States oil industry will be required to:

1. Produce 6,432,900 bbl. daily of crude oil, 4.7 per cent more than the average production during 1951.

2. Produce natural gasoline and related products at the rate of 590,000 bbl. daily, 5.9 per cent more than in 1951.

3. Operate refineries at the average rate of 6,865,900 bbl. per day, an increase of 5.7 per cent over 1951.

4. Import 911,500 bbl. daily of crude and products.

5. Withdraw from stocks of crude and products 4,900 bbl. daily, compared to an average stock increase of 80,840 bbl. daily in 1951.

Details of the foregoing forecast for 1952, compared with preliminary estimates for 1951 are presented in Table 1, and the quarterly forecasts for 1952 are set forth in Table 2.

Factors which currently make difficult the problems of forecasting for the oil industry and the assumptions here employed are:

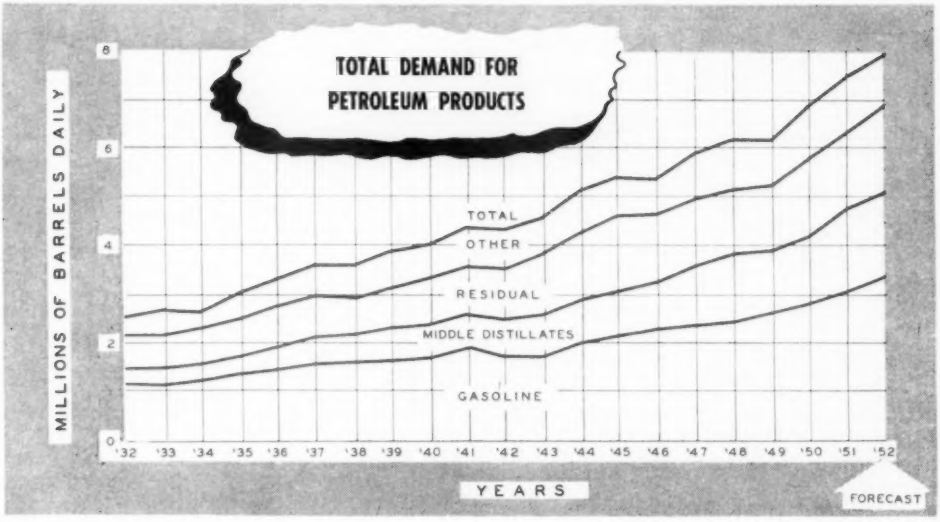
1. **Iranian Situation**

It has been assumed that no solution to current conditions in Iran will be found during 1952, and this source of petroleum can not be counted upon to supply its usual share of world demands. This assumption should not be interpreted as a forecast, as the situation involves political and psychological conditions not subject to prediction. It is, however, thought to be the "safest" basis for estimating requirement for United States petroleum. Any favor-

*Petroleum economist, The Atlantic Refining Co.

The Author Predicts . . .

- Total demand for 1952, 7,939,300 bbl. daily, an increase over 1951 of 472,500 bbl. daily or 6.3 per cent.
- Domestic demand gain of 7.6 per cent, to 7,577,300 bbl. daily.
- Motor-vehicle registrations to exceed 53,500,000 by year's end.
- Oil burners in use for home heating to average about 5,850,000.
- A decrease of 14.9 per cent for exports.
- Crude production to be up 4.7 per cent; other liquid hydrocarbons, up 5.9 per cent; and imports, up 7.5 per cent.
- Refinery runs to increase about 5.7 per cent to meet demand.



able development in Iranian negotiations will alter somewhat the forecast as presented.

2. **Military Requirements**

The assumptions employed in connection with military requirements are:

a. Requirements in the Korean theater will be virtually unaffected by any type of armistice during 1952, as substantial volumes of petroleum will be required to maintain security troops in that area.

b. More petroleum will be required to supply an increased number of troops in other overseas operations as well as armed forces at home.

c. Some military stockpiling of petroleum products seems likely.

3. **Weather Conditions**

Weather conditions, as they affect demands for petroleum products, are assumed to be normal. The full significance of the influence of weather on demands for petroleum products is found in an estimate that if "degree days" should vary as little as 5 per cent from normal in 1952, the total domestic demand for all petroleum may be changed by 0.7 per cent and domestic demand for middle distillates, by 2.7 per cent.

4. **Business Conditions**

It is expected that the general level of economic activity during 1952 will be at a somewhat higher level than during 1951 (FRB Index of production of about 233 vs. 220, an increase of 5.9 per cent from the 1951 level). The increase in business activity will come primarily from the impact of defense expenditures. Some soft spots, principally some consumer goods, may be expected. However, consumers will

Table 1—Demand and Supply of Petroleum Products

(Barrels daily)

	1951*	Per cent increase over 1950	1952 forecast	Per cent increase over 1951
	Quantity		Quantity	
Motor fuel	3,102,220	11.1	3,316,500	6.9
Domestic	2,995,380	9.9	3,229,000	7.8
Exports	106,840	59.1	87,500	—18.1
Kerosine	358,910	9.2	388,700	8.3
Domestic	337,650	4.5	365,000	8.1
Exports	21,260	279.6	23,700	11.5
Distillate fuels	1,288,840	15.5	1,417,400	10.0
Domestic	1,225,620	13.3	1,365,000	11.3
Exports	63,220	83.7	52,400	—17.1
Residual	1,614,400	3.5	1,685,000	4.4
Domestic	1,535,870	1.4	1,620,000	5.5
Exports	78,530	76.6	65,000	—17.2
Lubricants	163,410	12.3	162,800	—0.4
Domestic	115,270	8.2	121,600	5.5
Exports	48,140	23.5	41,200	—14.4
Wax	12,790	5.4	12,900	0.9
Domestic	9,000	1.5	9,400	4.4
Exports	3,790	15.9	3,500	—7.7
L.P.G. domestic (including L.R.G.)	282,920	21.3	310,000	9.6
Asphalt and road oil domestic	197,580	10.0	192,300	—2.7
Miscellaneous products and losses	342,320	11.6	362,500	5.9
Domestic	319,640	13.9	340,000	6.4
Exports	22,680	54.6	22,500	—0.8
Crude	103,390	—27.0	91,200	—11.8
Domestic (as such and losses)	22,430	—51.6	25,000	11.5
Exports	80,960	—15.1	66,200	—18.2
Demand for all oils	7,466,780	9.8	7,939,300	6.3
Domestic	7,041,360	8.3	7,577,300	7.6
Exports	425,420	40.0	362,000	—14.9
Stock changes	+80,840		—4,900	
Crude	+17,640		—11,600	
Products	+63,200		+6,700	
Total new supp'y	7,547,620	11.9	7,934,400	5.1
Imports	847,770	0.1	911,500	7.5
Crude	499,900	2.7	537,600	7.5
Products	347,870	—3.4	373,900	7.5
Domestic supply	6,699,850	13.6	7,022,900	4.8
Crude production	6,142,800	13.7	6,432,900	4.7
Natural gasoline (inc. benzene)	557,050	11.9	590,000	5.9
Crude run to stills	5,497,680	13.2	5,865,900	5.7

*Fourth quarter estimated.

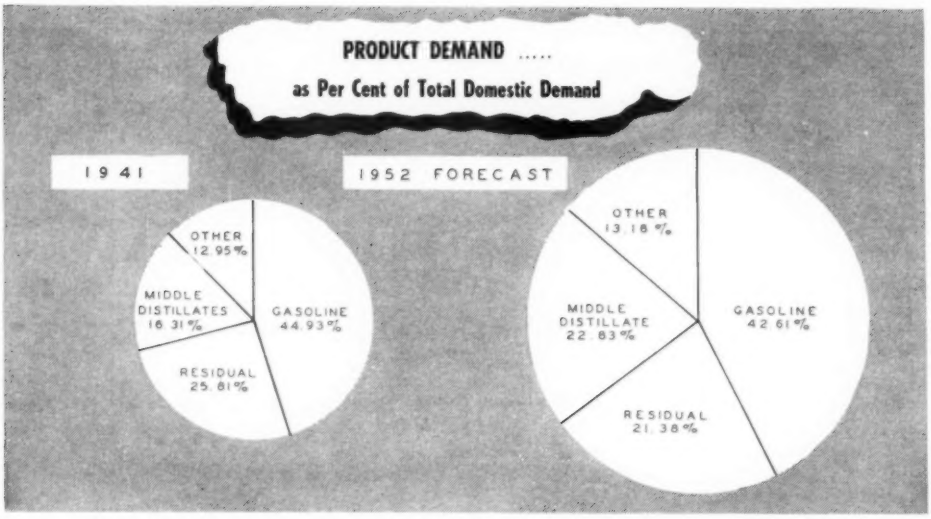


Table 2—Demand and Supply of Petroleum Products—1952 Quarterly Forecast

(Barrels daily)

	First quarter		Second quarter		Third quarter		Fourth quarter	
	Quantity	Per cent increase over 1951	Quantity	Per cent increase over 1951	Quantity	Per cent increase over 1951	Quantity	Per cent increase over 1951*
Motor fuel	2,939,000	7.6	3,478,000	8.3	3,552,000	6.4	3,295,000	5.6
Domestic	2,844,000	6.6	3,383,000	8.5	3,467,000	8.6	3,220,000	7.2
Exports	95,000	48.9	95,000	2.5	85,000	—43.3	75,000	—37.5
Kerosine	515,000	8.7	271,000	14.6	266,000	7.8	503,000	4.8
Domestic	485,000	3.4	246,000	11.6	246,000	15.6	483,000	7.4
Exports	30,000	548.0	25,000	55.5	20,000	—41.0	20,000	—33.3
Distillate fuels	1,880,000	9.0	1,075,000	12.4	1,055,000	11.0	1,681,000	8.6
Domestic	1,810,000	6.8	1,015,000	12.8	1,015,000	18.7	1,621,000	11.0
Exports	70,000	129.9	60,000	5.8	40,000	—57.8	40,000	—42.9
Residual	1,875,000	2.7	1,520,000	—1.5	1,550,000	9.7	1,785,000	6.8
Domestic	1,800,000	0.7	1,450,000	—0.9	1,490,000	14.8	1,740,000	8.8
Exports	75,000	95.3	70,000	—12.4	60,000	—47.8	55,000	—31.2
Lubricants	160,000	1.8	170,000	—0.1	165,000	0.5	156,000	—3.7
Domestic	115,000	0.0	125,000	3.1	125,000	12.2	121,000	6.6
Exports	45,000	6.5	45,000	—8.1	40,000	—24.1	35,000	—27.8
Wax	12,500	—11.5	13,000	—2.5	13,000	11.1	13,000	8.3
Domestic	9,000	—10.4	9,500	4.1	9,500	13.9	9,500	11.8
Exports	3,500	—14.4	3,500	—16.9	3,500	4.2	3,500	0.0
L.P.G. domestic (inc. L.R.G.)	335,000	11.2	280,000	7.9	285,000	9.1	340,000	9.7
Asphalt and road oil, domestic	110,000	1.7	205,500	—5.5	285,500	—4.8	167,500	2.8
Misc. products and losses	348,500	14.6	368,500	1.8	381,500	4.6	351,500	4.0
Domestic	325,000	13.0	345,000	2.2	360,000	6.5	330,000	4.8
Exports	23,500	43.5	23,500	—4.1	21,500	—19.5	21,500	—6.5
Crude	100,000	4.0	95,000	0.0	85,000	—27.4	85,000	—20.0
Domestic (as such and losses)	25,000	255.6	25,000	153.0	25,000	—41.0	25,000	—16.7
Exports	75,000	—15.9	70,000	—17.8	60,000	—19.8	60,000	—20.0
Demand for all oils	8,275,000	7.0	7,476,000	5.8	7,638,000	6.5	8,367,000	5.9
Domestic	7,858,000	5.5	7,084,000	6.5	7,308,000	10.4	8,057,000	8.1
Exports	417,000	44.2	392,000	—4.0	330,000	—40.1	310,000	—31.1
Stock changes	—485,000		+364,000		+360,000		—260,000	
Crude	—57,000		—10,000		+20,000		0	
Products	—428,000		+374,000		+340,000		—260,000	
Total new supply	7,790,000	4.5	7,840,000	3.7	7,998,000	6.2	8,107,000	6.0
Imports	900,000	—2.8	830,000	—5.3	908,000	17.7	1,007,000	18.8
Crude	500,000	3.4	530,000	—0.7	550,000	4.7	570,000	23.9
Products	400,000	—9.5	300,000	—13.2	358,000	45.7	437,000	21.4
Domestic supply	6,890,000	5.6	7,010,000	4.9	7,090,000	4.9	7,100,000	4.0
Crude production	6,300,000	5.6	6,430,000	4.7	6,500,000	4.7	6,500,000	4.0
Natural gaso. (inc. benzene)	590,000	4.7	580,000	7.1	590,000	7.7	600,000	4.3
Crude run to stills	6,732,000	3.7	6,850,000	7.1	6,920,000	6.1	6,960,000	5.8

*Fourth quarter estimated.

TABLE 3—PASSENGER CARS IN UNITED STATES
(In thousands)

	Registration end of year	Vehicles exempt from registration	Factory sales domestic market	Misc. supply	Units scrapped	Average in use
1941	29,524	75	3,682		1,528	28,521
1947	30,719	126	3,297	10	676	29,529
1948	33,261	137	3,676	28	1,151	32,122
1949	35,283	141	4,963	8	1,935	34,916
1950	40,161	148	6,513	22	2,654	38,374
1951*	42,430	155	5,100	15	2,845	41,450
1952	44,353	160	4,500	15	2,585	43,550

*Estimated.

TABLE 3A—TRUCKS IN UNITED STATES
(In thousands)

	Registration end of year	Vehicles exempt from registration	Factory sales domestic market	Misc. supply	Units scrapped	Average in use
1941	4,859	210	743		514	4,954
1947	6,512	296	988	60	226	6,397
1948	7,227	328	1,173	1	427	7,182
1949	7,693	335	1,003	1	532	7,791
1950	8,239	366	1,186		609	8,315
1951*	8,564	385	1,250		911	8,777
1952	8,979	400	1,150		720	9,164

*Estimated.

TABLE 3B—BUSES IN UNITED STATES
(In thousands)

	In use end of year	Sales of buses	Units scrapped	Average in use
1941	146	17	13	144
1947	175	39	26	168
1948	183	32	24	179
1949	189	19	13	186
1950	193	20	18	191
1951*	207	25	11	200
1952	215	18	10	211

*Estimated.

TABLE 3C—ESTIMATED DIESEL POWER VEHICLES INCLUDED IN "AVERAGE IN USE"
(In thousands)

	Trucks	Buses
1947	15	20
1948	18	26
1949	22	30
1950	30	32
1951	42	36
1952	54	40

have increased spendable income despite higher taxes.

Forecast demands for specific petroleum products and some factors determining these demands are:

Motor fuel.—The total demand for motor fuel is expected to attain an all-time peak of 3,316,500 bbl. daily, an increase of 6.9 per cent, although exports during 1952 will be some 18 per cent, about 19,000 bbl. daily, below the volume exported during 1951.

TABLE 4—FUELS CONSUMED BY HIGHWAY VEHICLES
(Barrels daily)

	1950	1951*	1952	Per cent of 1941
Motor fuel:				
Passenger cars	1,614,390	1,731,510	1,835,700	153
Trucks	596,980	624,660	660,400	180
Buses	36,000	36,880	35,600	116
Total motor fuel	2,247,370	2,393,050	2,531,700	159
Diesel Fuel:				
Trucks	23,640	32,700	43,300	
Buses	12,770	15,250	16,900	
Total diesel fuel	36,410	47,950	60,200	

*Estimated.

An increase of 7.8 per cent in the domestic demand for 1952 is predicted.

It is expected that 4,500,000 new passenger cars will be sold to domestic purchasers (compared to 5,100,000 in 1951) and fewer new trucks will be available than in 1951.

Middle distillates.—Domestic and export demands for these items—kerosine, heating oils, diesel oils, and miscellaneous distillate—will approximate 1,806,100 bbl. daily, 9.5 per cent above the 1951 demand.

Domestic demand for middle distillates is forecast to be 10.5 per cent greater than in 1951, and average 1,730,000 bbl. daily.

Demands for diesel fuels continue to increase at rates greater than the demands for most other petroleum products. Although the volume consumed by diesel engines is still a relatively small fraction of total petroleum sales, it is expected that the 1952 consumption of diesel fuels will be 15.7 per cent greater than in 1951, and 5.4 times the amount consumed in 1941.

In forecasting the demands for home-heating oils, it was assumed that during 1952 there would be only 550,000 units made available for home heating (the smallest quantity since 1947.) Of these, 194,000 burners will be required to replace obsolete units. Burners in use during 1952 will average 5,850,000, an increase of 408,000 or 7.5 per cent over average in use during 1951.

Residual fuels.—Domestic demand is forecast to average 1,620,000 bbl. per day, 5.5 per cent more than the 1951 average demands. This projection includes a "guess" as to the requirements of armed forces and an estimate of the inroads that natural gas will make in the residual-fuel markets.

Lubricants.—An appraisal of the various factors influencing demands for lubricants resulted in a projection of 126,000 bbl. a day of domestic demand for lubricating oils during 1952.

This demand, joined with the export requirements and adjusted by the volume of additives employed to produce lubricating oils, results in a refinery production requirement of 162,800 bbl. daily, an amount

TABLE 5—DOMESTIC CONSUMPTION OF GASOLINE
(Barrels daily)

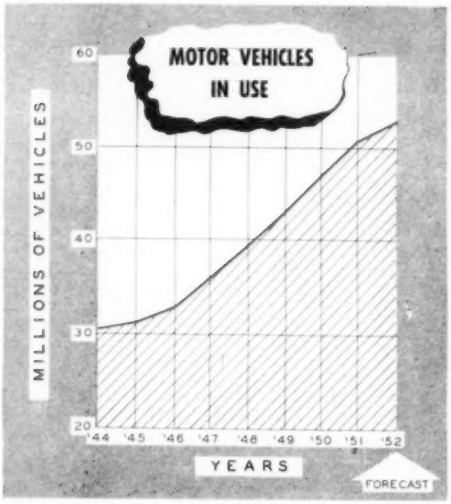
	1950	1951*	1952
Highway consumption of motor fuel (Table 4)	2,247,370	2,393,050	2,531,700
Agricultural nonhighway	208,440	220,000	227,700
Industrial and miscellaneous†	100,740	122,340	156,400
Total motor fuel	2,556,550	2,735,390	2,915,800
Aviation gasoline†	108,460	184,650	231,000
Industrial naphthas	59,590	75,340	82,200
Total	2,724,600	2,995,380	3,229,000

*Estimated. †Includes government use. Aviation gasoline includes jet fuel from gasoline fraction.

TABLE 6—COMPONENT PARTS OF MIDDLE DISTILLATE DOMESTIC DEMAND
(Barrels daily)

	1950	1951*	1952	Per cent of 1941
Kerosine	322,960	337,650	365,000	192
Distillate fuels	794,500	877,670	962,800	241
Diesel fuels	286,910	347,950	402,200	537
Total	1,404,370	1,563,270	1,730,000	251

*Estimated.



somewhat lower than the refinery production for 1951.

During 1952, the domestic demands for specific petroleum products will have nearly the same relative position as in 1951. However, residual fuel continues to lose its importance relative to its 1941 position, and the portion of domestic demand comprised of middle distillates continues to increase.

Conclusions

The petroleum industry, at all levels, will be required to operate at a higher rate than ever before. Present producing capacity is adequate to meet forecast demand for domestic crude oil, but greater exploratory and development activity, resulting in the drilling of upward of 45,000 wells during the year, will be necessary to improve the position of our reserve capacity.

Existing refineries, together with expansion scheduled for completion during 1952, should provide adequate facilities for refining the required volume of each of the various products.

Some temporary difficulties may be met in transporting crude oil from wells to refineries, but if pipe lines under construction from the Rocky Mountain and West Texas districts are completed on their present schedules, difficulties should be overcome before the fourth quarter.

The availability of tankers is expected to follow much the same pattern as that experienced in the past 2 years. Once again maximum effort will need to be made to move heating-oil supplies as close as possible to their point of ultimate consumption prior to the heating season. Existing product storage facilities, at primary and secondary levels, should be used as advantageously as possible and should be expanded as material allocations permit.

TABLE 7—DOMESTIC CONSUMPTION OF MIDDLE DISTILLATES
(Barrels daily)

	1950	1951*	1952	Per cent of 1941
Range oil	259,350	273,430	295,100	234
Home heating oil	605,340	663,010	728,800	220
Railroads:				
Distillates	9,920	10,410	11,000	183
Diesel	123,520	156,160	185,000	2,454
Public utilities:				
Distillates	18,200	18,630	19,200	210
Diesel	17,980	18,080	18,400	369
Marine:				
Distillates	2,060	2,190	2,200	208
Diesel	33,200	38,900	41,100	142
Trucks and buses:				
Diesel (Table 4)	36,410	47,950	60,200	
Industrial (incl. Oil Co.):				
Distillates	76,260	82,740	89,800	403
Diesel	41,020	48,490	51,500	547
Miscellaneous:†				
Distillates‡	146,320	164,910	182,700	(§)
Diesel	34,770	38,370	46,000	(§)
Total	1,404,370	1,563,270	1,730,000	281

*Estimated. †Includes government, agricultural and other uses. ‡Includes jet fuel from kerosine and distillate fractions. §1941 data not comparable with later years.

TABLE 8—OIL BURNERS FOR HOME HEATING
(In thousands)

	In use end of year	Domestic sales	Indicated scrapped	Average in use
1941	2,402	333	66	2,269
1947	3,650	888	59	3,236
1948	3,976	455	131	3,813
1949	4,491	615	100	4,233
1950	5,172	818	136	4,831
1951*	5,672	675	175	5,422
1952	6,028	550	194	5,850

*Estimated.

TABLE 9—DOMESTIC DEMAND FOR RESIDUAL FUELS
(Barrels daily)

	1950	1951*	1952	Per cent of 1941
Commercial heating	199,220	199,450	217,800	171
Railroad	166,790	150,690	145,200	66
Public Utilities	254,960	216,440	230,100	250
Industry (incl. Oil Co.)	551,720	568,500	602,000	166
Marine (incl. heavy diesel)	254,650	282,190	284,000	183
Miscellaneous†	87,580	118,600	140,900	151
Total	1,514,920	1,535,870	1,620,000	154

*Estimated. †Incl. government.

TABLE 10—DEMANDS FOR LUBRICATING OILS AND GREASES
(Barrels daily)

	1950	1951*	1952	Per cent of 1941
Automotive lubricants	60,110	62,820	65,800	162
Aviation lubricants	1,800	2,470	2,900	446
Total	61,910	65,290	68,700	166
Mobile diesel-engine lubricants	4,160	5,120	6,100	658
Industrial lubricants	44,240	49,010	51,200	117
Domestic consumption	110,310	119,420	126,000	148
Exports	38,980	48,140	41,200	152
Total demand	149,290	167,560	167,200	148
Supply from other than petroleum sources	3,800	4,150	4,400	139
Supply required from petroleum processing	145,490	163,410	162,800	147

*Estimated.

TABLE 11—DOMESTIC DEMAND FOR SPECIFIC PETROLEUM PRODUCTS AS PER CENT OF TOTAL DOMESTIC DEMAND

	1941	1950	1951*	1952
Motor fuel	44.93	41.92	42.54	42.61
Middle distillates	16.31	21.61	22.20	22.83
Residual fuel	25.81	23.31	21.81	21.38
Lubricants and waxes	2.16	1.78	1.77	1.73
L.P.G.	0.74	3.59	4.02	4.09
Miscellaneous and losses	10.05	7.79	7.66	7.36
Total	100.00	100.00	100.00	100.00

*Estimated.

Increased U. S. Imports Seen Again for '52

Outlook for 1952 is for new high levels, both of crude oil, and of products

by Henry D. Ralph

EVEN if Iran doesn't export a barrel of oil this year, the United States can expect in 1952 a resumption of the trend of increasing imports and decreasing exports of both crude and products.

That trend would have been marked last year but for the fact that Iranian crude and products were lost to the world markets. Making up that deficit held our total imports to a figure only slightly above 1950 (though crude imports reached a new high) and boosted our exports of products to the highest point since the war years.

During the winter, however, the world supply-demand situation has so adjusted itself that the outlook now is for 1952 to show new high levels of imports into the United States of both crude and products, a new low in exports of crude, and exports of products remaining relatively high for a few months but dropping rather rapidly toward the end of the year.

Much Hinges on Iranian Activity

Of course if Iranian crude and products should come back into world commerce in sizable quantity, these forecasts would turn sour. Then our exports of products would drop a lot more, and additional crude, mostly from the Caribbean, would seek an outlet in this country.

A glance at the accompanying table shows how imports of both crude and products have been going up, up, up ever since the war. The peak of crude imports came early last summer (531,000 bbl. per day during the second quarter of 1951) and then, with the Iranian shutdown sloughed off to 470,000 bbl. daily the fourth quarter. For 1952 the Journal's estimate (a compendium of informed opinion) is: Crude imports will rise to 500,000 bbl. daily the first quarter, 530,000 the second, 550,000 the third, and 570,000 the fourth.

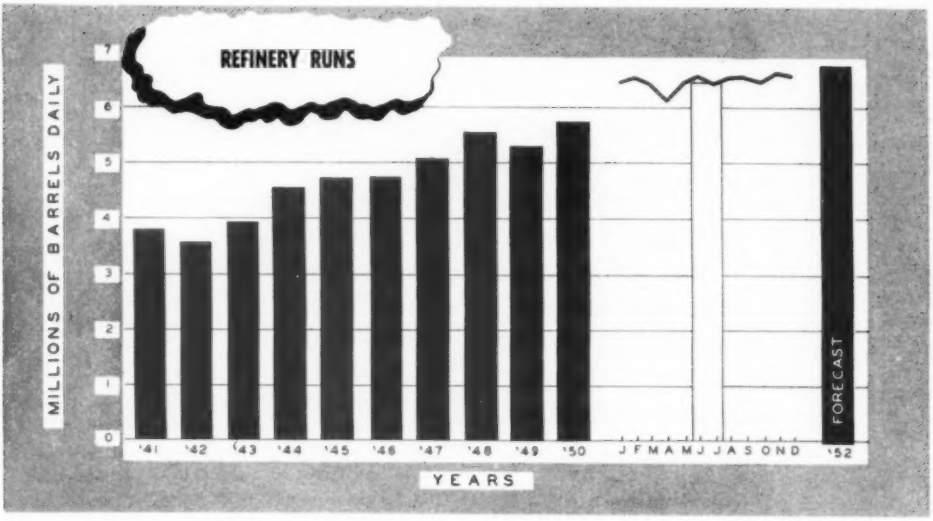
Imports of products (chiefly Caribbean heavy fuel oil) hit an all-time high of 443,000 bbl. daily during the first quarter of 1951, but that peak probably won't be reached this year. Our estimate for 1952 is 400,000 bbl. daily the first quarter, 300,000 the second, 358,000 the third, and 437,000 the fourth quarter.

The table shows that over a period of years exports of products have fluctuated considerably without exhibiting a marked trend. However, new refinery capacity in Europe should soon start whittling down our export market sharply. Look for a steady decline in products exports all through 1952, with an average for the year of 296,000 bbl. daily—which still is better than the nation's exports during many of the past 15 years. The anticipated drop in crude exports is due to Canada's growing self-sufficiency.

IMPORT-EXPORT TRENDS
(Thousands of barrels daily)

	Imports			Exports		
	Crude	Products	Total	Crude	Products	Total
1935	88	56	144	141	212	353
1936	89	67	156	137	223	360
1937	75	82	157	184	290	474
1938	72	77	149	212	319	531
1939	91	71	162	198	320	518
1940	117	112	229	141	215	356
1941	139	127	266	91	207	298
1942	34	64	98	93	227	320
1943	38	136	174	113	298	411
1944	122	130	252	94	477	571
1945	203	108	311	90	411	501
1946	236	141	377	116	303	419
1947	267	170	437	127	324	451
1948	353	161	514	109	259	368
1949	421	224	645	91	236	327
1950	487	360	847	95	209	304
1951*	500	348	848	81	344	425
1952†	538	374	912	66	296	362

*Ten months actual, 2 months estimated. †Forecast.



Refiners Set Record Increase in 1951

Total runs for year average nearly 6.5 million barrels daily, up 13.2 per cent

by John C. Casper

REFINERS not only used more crude in 1951 than in any year in the past but also set a new record increase over the previous year.

Total runs for the year averaged 6,495,000 bbl. daily, a gain of 756,000 bbl. daily or 13.2 per cent. The previous record for volumetric gain in a year was for 1944 when war demands resulted in an increase of 633,900 bbl. daily.

Part of the large increase in refinery operations in 1951 was needed to raise operating inventories of refined products. Product stocks increased at the rate of about 63,000 bbl. daily, representing about 8 per cent of the increase in refinery input.

Also, a larger part of total demand was supplied by refineries in this country. The closing of the Abadan refinery resulted in a sharp drop in product imports, mostly residual fuel, in the last half of the year and a decrease for the year of almost 3.5 per cent.

The stock-building program and decreased product imports account for the increase of 13.2 per cent in refinery runs in a year when total demand was up about 9.8 per cent.

These same factors will influence the refining picture in 1952. Many suppliers feel that over-all product inventories will not have to be raised in 1952. Also, European refineries are taking over a larger part of the job of supplying customers formerly served from Abadan. More heavy fuel from Caribbean refineries will be seeking a market in this country. The result is a forecast increase of 6.3 per cent in total demand to be met by an increase of about 5.7 per cent in refinery runs.

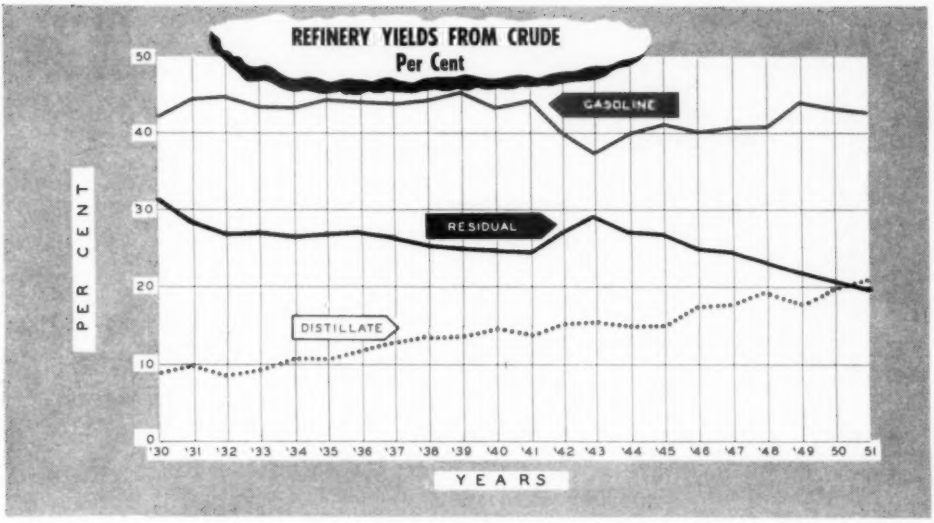
Refinery runs in 1951 were 68.2 per cent greater than in 1941. The largest relative gain for the 10-year period was for the Gulf Coast area of Louisiana where the wartime expansions were followed by large postwar construction programs to give the district a gain of 237 per cent.

In the 30-year period since 1921, refinery runs have increased 434.6 per cent, but the changes by districts have varied widely. Operations in the Illinois-Indiana-Kentucky-Michigan area are up 1,043 per cent from the 1921 level. Early discoveries of crude in the Mid-Continent resulted in the development of an active refining industry in the Oklahoma-Kansas-Missouri district by 1921. Runs in that year were only about 11,000 bbl. daily less than in the Texas Gulf district. Since the development in the Mid-Continent did start early in our oil history, the percentage gain for this district has been only about 200 per cent for the 30-year period.

The year 1951 saw another record established at refineries in this country. This was the first year in which refiners made more distillate fuel than residual. Production of distillate for the year was 478,200,000 bbl. compared with 468,600,000 bbl. of residual.

REFINERY YIELDS BY DISTRICTS—1951
(Per cent)

	Gasoline	Kerosine	Distillate	Residual
East Coast	37.1	4.4	24.1	22.3
Appalachian:				
District 1	42.1	5.9	15.6	11.2
District 2	45.8	6.3	12.4	22.1
Illinois, Indiana, etc.	49.7	6.2	17.5	14.5
Okla., Kansas, etc.	48.3	3.1	23.4	12.5
Texas Inland	50.4	5.2	15.1	17.1
Texas Gulf	40.9	8.4	22.4	16.8
Louisiana Gulf	42.6	11.3	22.7	11.8
N. La.-Arkansas	33.6	9.2	21.0	9.8
New Mexico	50.1	2.1	17.8	24.5
Other Rocky Mtn.	45.0	2.9	19.3	20.9
California	35.9	0.9	14.3	38.1
Total	42.4	5.7	20.1	19.7



REFINERY RUNS BY DISTRICTS
(Thousands of barrels daily)

	1921	1931	1941	1946	1947	1948	1949	1950	1951	Per cent increase 1951 over 1950	Per cent increase 1951 over 1921
East Coast	265	463	595	758	815	867	768	908	1,014	11.7	282.6
Appalachian	53	100	146	153	166	157	155	165	179	8.5	237.7
Ill., Ind., etc.	105	316	688	767	826	908	915	1,039	1,200	15.5	1,042.9
Okla., Kans., Mo.	174	288	348	379	419	452	425	486	522	7.4	200.0
Texas Inland	67	168	183	216	232	246	217	209	246	17.7	267.2
Texas Gulf	185	427	995	1,163	1,197	1,392	1,283	1,312	1,566	19.4	746.5
Louisiana Gulf	70	110	149	332	383	435	432	470	502	6.8	617.1
N. La. and Ark.	16	54	81	60	68	81	75	71	79	11.3	393.8
Rocky Mountain	45	51	92	132	143	164	177	199	230	15.6	411.1
California	235	474	584	780	826	847	879	880	957	8.8	307.2
Total United States	1,215	2,451	3,861	4,740	5,075	5,549	5,326	5,739	6,495	13.2	434.6

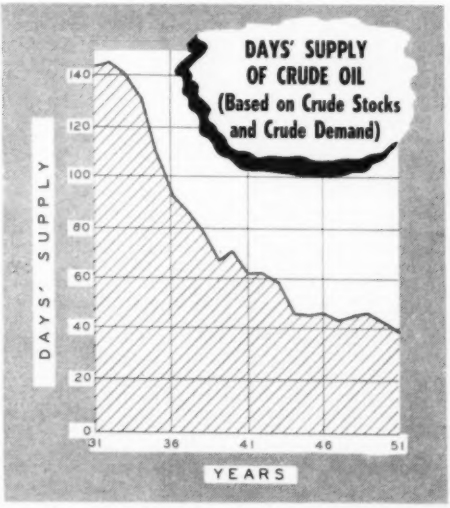
REFINERY YIELD TRENDS

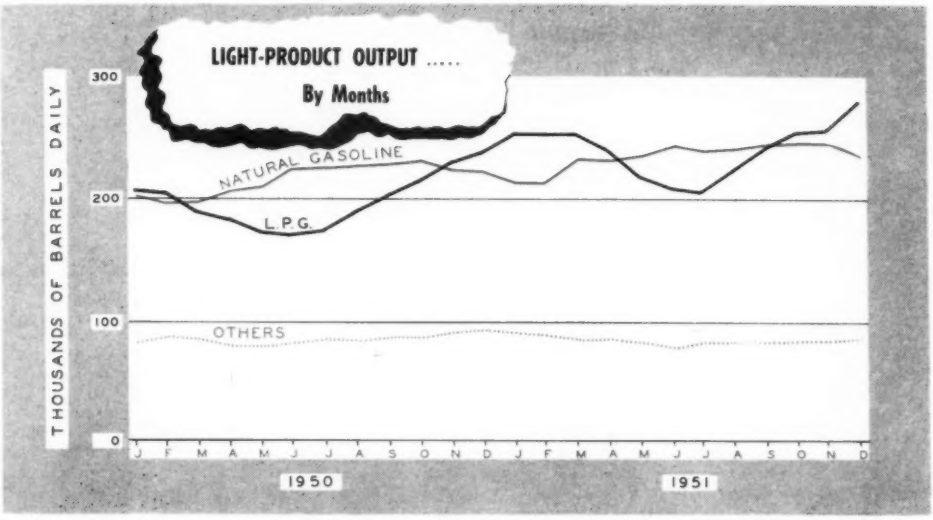
	Runs (thou. bbl. daily)	Yields (per cent) Gasoline	Kerosine	Distillate	Residual
1930	2,541	42.0	5.3	9.8	31.4
1931	2,451	44.3	4.7	9.4	28.3
1932	2,240	44.7	5.3	8.5	27.5
1933	2,360	43.7	5.7	9.2	27.6
1934	2,454	43.4	6.0	10.6	26.8
1935	2,646	44.2	5.8	10.4	26.9
1936	2,920	44.1	5.3	11.8	27.0
1937	3,242	43.9	5.5	12.4	26.4
1938	3,192	44.3	5.5	13.0	25.3
1939	3,191	45.0	5.5	13.1	24.7
1940	3,536	43.1	5.7	14.2	24.4
1941	3,861	44.2	5.2	13.4	24.3
1942	3,655	39.8	5.1	14.7	26.9
1943	3,917	37.1	5.0	14.8	29.2
1944	4,551	39.4	4.7	14.4	27.7
1945	4,711	40.9	4.7	14.5	27.3
1946	4,740	39.6	6.0	16.6	24.9
1947	5,075	40.2	6.0	16.8	24.2
1948	5,549	40.3	6.0	18.7	22.9
1949	5,327	43.7	5.2	17.4	21.7
1950	5,739	43.0	5.6	19.0	20.2
1951	6,495	42.4	5.7	20.1	19.7

The great expansion in the use of distillate fuels for home heating and the increasing popularity of diesel oils for railroad fuel and in recent years for trucks and buses resulted in a shift in percentage yields of distillate from 13.4 in 1941 to 20.1 in 1950.

On the other hand, much of the research by refiners has been directed toward the reduction of residual yields, since this product, in competition with coal, normally sells for less than the crude from which it was made.

Gasoline from crude passed the billion-barrel mark for the first time in 1951. Production for the year was about 1,009,000,000 bbl. Additional motor fuel was available from blending with natural gasoline and from finished gasoline production at natural-gasoline and cycling plants.





Light Hydrocarbons Continue Soaring Climb

Production for 1952 may hit nearly 600,000 bbl. daily, up 6.6 per cent over 1951

by John C. Casper

PRODUCTION at natural-gasoline and cycling plants in 1951 continued the steep upward trend that has existed since the end of the war. Total production at all plants averaged 561,200 bbl. daily, an increase of 63,800 bbl. daily or 12.8 per cent over the very high average that was set in 1950.

The 1951 average was about twice the record which was set in the high-demand war year 1944, and was 2.5 times production in 1941, the first year for which complete data on plant production were collected by the Bureau of Mines. Reports for prior years did not include L.P.G.

Production for 1952 is expected to average about 598,000 bbl. daily or 6.6 per cent greater than for the past year.

Growth in the production of light hydrocarbons has been influenced by two major factors—demand for light products and the spreading public demand for the conservation of natural gas. For the year 1952, there are two other factors, either or both of which may limit production for the year. These are the probable shortage of material for plant and pipe line construction, and increased operating and construction costs at a time when product realization is limited by price ceilings.

Potential demand for light hydrocarbons in 1952, particularly for L.P.G., will be up more than the 6.6 per cent increase estimated for total production. Since consumption of L.P.G. is still highly seasonal, actual shortages in the winter months result in shifts to other fuels. Some potential customers have hesitated about changing to L.P.G. because of possible shortages in periods of extremely cold weather.

Our greatest expansion in long-distance gas transmission has been in the past 3 years. The abnormal increase in marketed production of natural gas called for a corresponding gain in plant capacity. Since the construction of major gas lines will be limited by shortage of steel, gas consumption and gas treating may not have the high percentage increases of the past 2 years.

Texas accounted for 53.2 per cent of total plant production in 1951, indicating a larger relative gain than for the country as a whole since the Texas portion in 1950 was only 51.5 per cent of the total. Natural-gasoline and cycling plants in Texas produced 35 per cent more than plants in all other states in 1941.

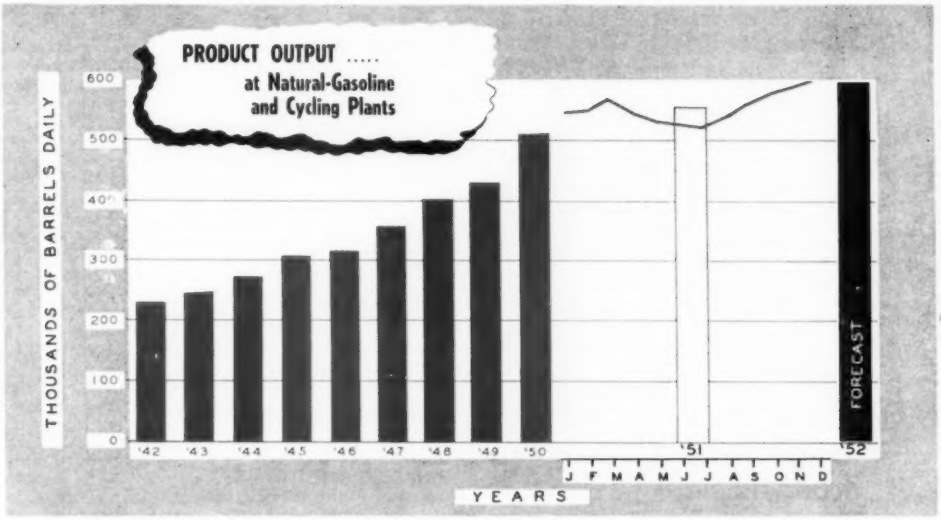
California continued in second place as a producer, followed by Louisiana and Oklahoma. These four states reported 86.7 per cent of all light-hydrocarbon production in 1951.

Production at cycling plants represented 21.7 per cent of total plant output in 1951 compared with 24.6 per cent of the total in 1950 and 27.2 per cent in each of the 3 years 1947, 1948, and 1949.

War's End Saw Great Cycling-Plant Output

The greatest expansion in cycling-plant operation came soon after the end of the war, but the growth was limited by the number of fields where this method of production was necessary. A large part of the recent plant-construction program has been devoted to the conservation of casing-head gas in oil fields. Increasing demand for light liquids and the larger volumes of gas needed for the large long-distance gas lines have forced the construction of more natural-gasoline plants.

A survey of plant construction in 1951 and projects scheduled for 1952 indicates that a large part of the program has been slanted toward increased produc-



tion of L.P.G. New plants and additional units at existing plants are designed for higher recovery of propane.

It is this program for higher L.P.G. recovery that may be blocked by current price ceilings on propane and propane-butane mixtures. Since the cost per gallon increases with the percentage of propane extracted, operators may not be able to push propane extraction to the point needed to supply the demand unless ceilings are permitted to rise with increases in construction and operating costs.

Another record was established in 1951. It was the first year in which total production of L.P.G. for the year exceeded production of natural gasoline. L.P.G. output averaged 240,400 bbl. daily compared with 235,600 bbl. daily for natural gasoline.

This trend toward larger relative gains for L.P.G. has existed since 1941. In that year, 20.8 per cent of plant production was classified as L.P.G. and the percentage of the total has been higher each year except in 1946, the first year after the war, when there was a big drop in demand for L.P.G. as raw material for synthetic rubber components.

Group 3 price for 26-70 natural gasoline was 6.875 cents at the beginning of 1951. Price reductions early in the year included cuts of .5 cent on February 12, .5 cent on April 3, and .375 cent on April 6. Increases of .375 cent on September 4, .5 cent on September 11, and .5 cent on October 2 brought the price back to ceiling level for the last 3 months of the year.

TOTAL PRODUCTION AT NATURAL-GASOLINE AND CYCLING PLANTS
(Thousands of barrels daily)

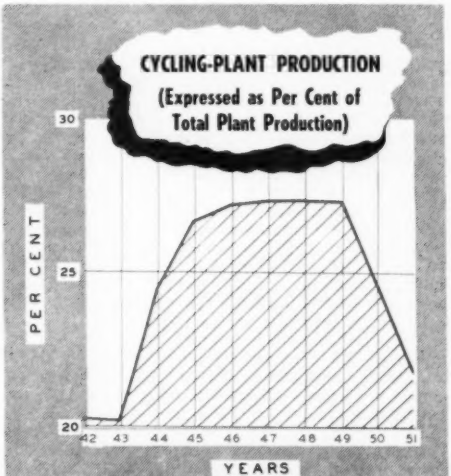
	1947	1948	1949	1950	*1951
Appalachian	10.5	11.1	11.3	14.0	17.6
Illinois, Kentucky, Michigan	14.8	14.1	13.5	13.6	13.2
Kansas	6.5	7.0	7.3	10.0	11.2
Oklahoma	29.1	30.5	34.2	40.2	46.9
Texas	172.2	197.0	211.0	256.4	298.6
Arkansas	6.1	6.2	6.2	6.4	6.5
Louisiana	41.0	46.2	52.8	56.1	60.7
Mississippi	1.3	3.1	3.5	3.5	3.2
New Mexico	7.4	8.5	11.0	14.0	15.4
Other Rocky Mountain	3.8	4.6	5.2	5.9	7.7
California	69.4	72.6	74.4	77.3	80.2
Total	362.1	400.9	430.4	497.4	561.2

*Ten months actual, 2 months estimated.

PRODUCT OUTPUT AT NATURAL-GASOLINE AND CYCLING PLANTS
(Thousands of barrels daily)

	Natural gasoline	L.P.G.	Other products	Total	Per cent increase	Per cent L.P.G.
1941	144.1	46.1	31.3	221.5		20.8
1942	135.1	50.5	42.7	228.3	3.0	22.1
1943	138.0	59.4	42.9	240.3	5.3	24.7
1944	142.4	76.1	54.8	273.3	13.7	27.9
1945	163.0	92.2	51.7	306.9	12.3	30.0
1946	175.5	91.9	49.7	317.1	3.3	29.0
1947	179.0	123.4	59.7	362.1	14.2	34.1
1948	193.8	143.7	63.4	400.9	10.7	35.8
1949	196.3	158.5	75.6	430.4	7.4	36.8
1950	216.0	197.0	84.4	497.4	15.6	39.6
*1951	235.6	240.4	85.2	561.2	12.8	42.8
†1952	246.0	268.0	86.0	598.0	6.6	44.5

*Ten months actual, 2 months estimated. †Forecast.



World Crude-Oil Production

(Thousands of barrels daily)

Country—	1951*	1950	Per cent increase 1951 over 1950	1941
Western Hemisphere:				
Argentina	70.0	64.0	9.4	60.0
Bolivia	1.6	1.6		0.6
Brazil	2.1	0.8	162.5	
Canada	130.0	78.4	65.8	27.8
Chile	2.4	1.6	50.0	
Colombia	105.0	93.1	12.8	67.1
Cuba	0.3	0.3		0.4
Ecuador	7.7	7.4	4.1	4.3
Mexico	210.0	197.6	6.3	115.8
Peru	44.3	41.2	7.5	32.8
Trinidad	56.9	56.0	1.6	60.0
Venezuela	1,702.0	1,498.0	13.6	627.0
Total	2,332.3	2,040.0	14.3	995.8
Europe and Africa:				
France	5.7	2.4	137.5	1.1
French Morocco	1.6	0.8	100.0	
W. Germany	25.4	21.0	25.7	17.3
Italy	0.4	0.2	100.0	0.3
Netherlands	13.9	13.4	3.7	
Egypt	44.4	44.5	—0.2	23.4
United Kingdom	0.9	0.9		0.6
Total	93.3	83.2	12.1	42.7
Middle East:				
Bahrein	30.1	30.2	—0.3	18.6
Iran	350.0	665.4	—47.4	139.0
Iraq	173.5	136.2	27.4	34.6
Kuwait	562.0	355.0	58.3	
Qatar	49.5	34.1	45.2	
Saudi Arabia	761.0	546.7	39.2	11.8
Turkey	0.4	0.3	33.3	
Total	1,926.5	1,767.9	9.0	204.0
Other Asia:				
British Borneo	104.0	84.8	22.6	18.8
Burma	2.0	1.0	100.0	21.3
China	2.2	1.5	46.7	0.2
India	5.0	5.0		†8.0
Indonesia‡	150.0	141.0	6.4	147.0
Japan	6.5	5.6	16.1	5.3
New Guinea	4.8	4.8		
Pakistan	3.3	3.3		†
Total	277.8	247.0	12.5	200.6
Total foreign less Russia & E. Europe	4,629.9	4,138.1	11.9	1,443.1
Estimated Russia and E. Europe:				
Austria	41.0	34.0	20.6	11.6
Romania	85.0	85.0		111.0
Russia	790.0	754.0	4.8	664.0
Other E. Europe¶	27.0	23.8	13.5	17.8
Total	943.0	896.8	5.1	804.4
Total foreign	5,572.9	5,034.9	10.7	2,247.5
United States	6,144.0	5,399.0	13.8	3,841.7
World total	11,716.9	10,433.9	12.3	6,089.2

*Partly estimated. †India and Pakistan combined. ‡Western New Guinea listed separately. ¶Includes Albania, Czechoslovakia, Hungary, Poland, and Yugoslavia.

World Output Up, Despite Iranian Loss

Production of 12.5 million barrels daily is in prospect for current year

by Dahl M. Duff

FIGURES for 1951 on world crude-oil production tell the story of the petroleum industry's remarkable achievement in meeting and overcoming the loss of Iran's output.

Crude production last year averaged approximately 11,717,000 bbl. daily. The increase over 1950 amounted to 1,283,000 bbl. daily, despite the complete disappearance of what had been the world's fourth-largest oil-producing country.

The shutdown in Iran began in July, and as a result its average production for the entire year was 350,000 bbl. daily, a drop of more than 300,000 bbl. daily from what Anglo-Iranian Oil Co., Ltd., had been producing in the country.

Most of the deficit was made up by Kuwait, up 58.3 per cent to 562,000 bbl. daily in 1951; Saudi Arabia, up 39.2 per cent to 761,000 bbl. daily; and the United States, up 13.8 per cent to approximately 6,144,000 bbl. daily.

World production last year represented an increase of 12.3 per cent over 1950. This compares to a 12.1 per cent gain in 1950, a 0.6 per cent decline in 1949, a 13 per cent gain in 1948, and a 10.1 per cent gain in 1947.

The task of replacing the Iranian deficit and still providing for normal demand increase was accomplished by an all-out production effort elsewhere in the Middle East and by stepped-up output in the United States. Toward the end of the year, outside the United States there was very little reserve producing capacity that did not require additional field or pipe-line facilities for its utilization. This was true in Canada and Venezuela as well as in the Middle East.

A world production in 1952 of at least 12,500,000 bbl. daily is in prospect. A 5 per cent increase in the United States would give an average during the year of about 6,450,000 bbl. daily. A total of 5,000,000 bbl. daily, if not more, is indicated in the free nations outside the United States. And crude production of Russia and its satellites is expected to go beyond 1,000,000 bbl. daily during the coming year.

The forecast of slightly more than 5,000,000 bbl. daily non-Communist foreign production during the coming year appears to be considerably on the conservative side. This is, however, the production figure which the Petroleum Administration for Defense recently announced it would give its support to attain. *(The Oil and Gas Journal, December 13, 1951, page 61.)*

The total in the PAD program is 5,015,000 bbl. daily, including 2,395,000 bbl. daily in the Western Hemisphere, and 2,620,000 bbl. daily in the Eastern Hemisphere. Last October, Western Hemisphere production averaged approximately 2,390,000 bbl. daily, and that in the Eastern Hemisphere amounted to

2,190,000 bbl. daily. Thus, it seems the major effort in 1952 will be directed toward restoring Eastern Hemisphere production, which is mainly in the Middle East, to make up fully for the loss of Iran.

Most important single production development in the Middle East in 1952 will be the opening of the 30 and 32-in. pipe line of Iraq Petroleum Co., Ltd., from Kirkuk to the Mediterranean. This project will come into operation by stages beginning in April, and will provide an additional 314,000 bbl. daily when full capacity is reached early in 1953.

By the middle of the year, when the new pipe line will be capable of moving about 200,000 bbl. daily, total productive capacity in the Middle East will be approximately 2,300,000 bbl. daily. This is predicated on about 900,000 bbl. daily each from Saudi Arabia and Kuwait, 50,000 bbl. daily from Zubair, 170,000 bbl. daily through existing I.P.C. lines, 50,000 bbl. daily from Qatar, and 30,000 bbl. daily from Bahrein.

While these are approximate amounts, the 2,300,000-bbl.-daily total is 60,000 bbl. daily above the PAD estimate of 2,240,000 bbl. daily which that agency is supporting.

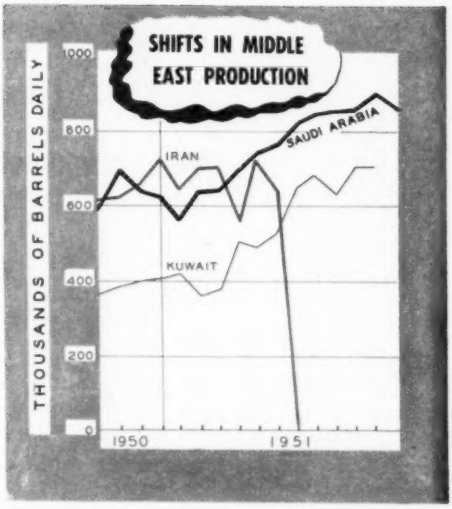
PAD's program in general blueprints a long-term foreign operation completely without Iranian production. The 1952 production figures apparently represent demand for crude from the world's various producing areas, thus leaving some reserve capacity. Even without Iran, A. D. Stewart, Socony-Vacuum foreign economist, has estimated that in 1952 the United States and all foreign areas, excluding Communist countries, will have the ability to produce crude at a rate approximately 1,000,000 bbl. per day above the anticipated demand *(The Oil and Gas Journal, December 20, 1951, page 276)*.

Crude production in Venezuela showed small but steady increases during 1951. The year's total was an all-time record. The 1952 Venezuela outlook is for further slight increases from month to month. Activity in Venezuela in existing concessions is definitely on the upgrade as measured by such indexes as rigs in operation, parties active, and wells drilled. The PAD program calls for drilling 1,424 wells in Venezuela during 1952 as compared to the approximately 1,200 wells during 1951. PAD said this 1952 drilling program would permit a production of 1,744,000 bbl. daily.

New records in crude production were a frequent occurrence during 1951. Practically all the major world oil areas established new highs in crude output at one time or the other during the year. Canada, which has the brightest production prospects in the Western Hemisphere, had an estimated 130,000-bbl. daily production in 1951. This is more than six times Canada's total output prior to 1947 when the Leduc discovery touched off the tremendous program in the Prairie provinces.

Production in Mexico showed a relatively small increase during 1951, according to the best available information. The estimated production in 1951 of 210,000 bbl. daily is the same figure as that set for Mexico in the PAD program for 1952. PAD indicated 482 for Mexico in 1952, while reports from Mexico indicated the lesser number of about 400 wells is planned in Mexico itself. Last year, only 251 wells were drilled, a fact which Sen. Antonio J. Bermudez, Petroleos Mexicanos head, said was due to floods which prevented transportation of drilling equipment.

Colombian production broke all records in 1951, as had been anticipated as a result of the increased Caribbean outlet provided by the expansion of the Andian National pipe line. The daily average, with condensate, was about 107,000 bbl. PAD's plans set Colombian production 1952 at 120,000 bbl. daily.



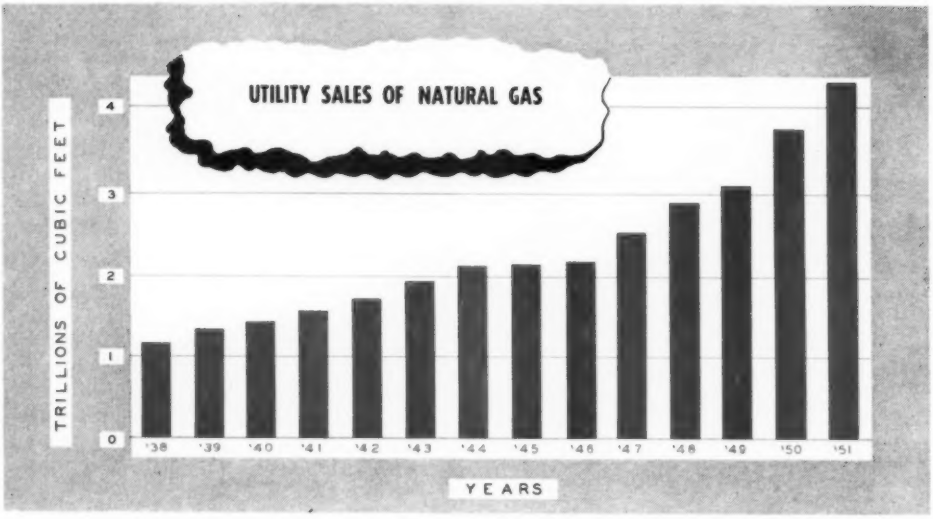
In Western Europe, the West German Republic had another encouraging rise in crude output to 26,400 bbl. daily. This production is equivalent to about 1,360,000 tons. The president of the Geological Research Institute at Hamburg recently forecast another increase in production in 1952 to 1,600,000 tons, or the equivalent of about 31,000 bbl. daily.

The more than twofold increase in production in metropolitan France was due entirely to the 1949 discovery at Lacq. This field is the only important commercial discovery to date in France itself as a result of the widespread exploration program being carried on with the support of the French Government. The size of this program is reflected in the fact that it involves use of some 40 drilling rigs.

In British Borneo the production rate appears to be leveling off from the spectacular rise it has made steadily since the end of the war. Most all this output of more than 100,000 bbl. daily comes from Seria field in Brunei which has some 85 flowing wells and 5 rigs in operation. PAD anticipates 100,000 bbl. daily from this area in 1952.

Indonesia's production rose about 9,000 bbl. daily last year to reach an estimated 150,000 bbl. daily. A considerably greater increase is expected during 1952, principally as a result of the beginning of commercial production from Minas field in Sumatra which was discovered prewar by Nederlandsche Pacific Petrolem Mij. (Caltex). Reports in the industry are that the development of this field has shown exceptionally large reserves. It will begin shipments this spring. The political status of western New Guinea where there is about 5,000 bbl. daily production is in dispute between Netherlands and Indonesia. PAD expects 170,000 bbl. daily this year in Indonesia, presumably including New Guinea.

There is no exact information on the level of production in Russia and its Communist allies. Estimates on production of crude oil—not including synthetics—in Russia itself are based on the occasional announcements of Russian authorities of percentage attainment of goals. On this basis, estimates generally agree on an output in Russia in 1951 of about 800,000 bbl. daily. Russian production has been increasing each year about 4,500,000 tons, or about 90,000 bbl. daily.



Utility Sales of Natural Gas Up 15.4 Per Cent

Number of customers topped 16 million; largest gain in industrial classification

by Dahl M. Duff

UTILITY sales of natural gas showed another substantial increase in 1951, rising 15.4 per cent over the total of the previous year.

Total sales amounted to 4,283,000,000,000 cu. ft., according to preliminary data of the American Gas Association. This is equivalent to daily average deliveries of approximately 11,700,000,000 cu. ft.

During the year, utility companies marketing natural gas increased their volume by 571,000,000,000 cu. ft. This increase was only slightly below the total gain made in 1950 which was the record year in expansion of utility natural-gas sales.

Although the growth of the natural-gas industry is by no means ended, the spectacular gains of the last few years may be replaced by a more moderate rate of expansion. Defense needs for steel undoubtedly are slowing down construction of large-diameter transmission lines. Last year saw the imposition of federal controls restricting the use of gas in new space-heating installations.

The development of the natural-gas transmission industry, particularly during the last decade, has brought this fuel to the position of one of the major suppliers of energy in the nation. Last year's sales represented an increase of 172 per cent over the amount of natural gas sold 10 years ago. During the same period, total customers of natural-gas utility companies rose from 7,619,000 to 16,141,000.

The phenomenal expansion of natural gas has been made possible by the construction of a network of gas-transmission lines that now reach into every section of the country except the Pacific Northwest. At the end of 1951, it was estimated that the natural-gas utility lines in the country exceeded 340,000 miles. This represents an increase of some 25,000 miles during the year. Included are field, gathering, and distribution as well as transmission lines. In 1941, by comparison, the total mileage of natural-gas lines in the country was 197,000. Most of the expansion has come since the end of the war; approximately 115,000 miles of natural-gas lines have been laid in the last 6 years.

The figures on utility natural-gas sales during 1951 show another slight rise in the proportion of the total sold for residential use. In 1950, 30 per cent of the natural gas sold by utilities went into homes where normal usage is divided 60 per cent for heating and 40 per cent for cooking and hot water. Last year this percentage was up to 30.9.

Data on utility sales provide an index of growth in the natural-gas industry but they are heavily affected by severity of the weather during the winter when the industry encounters its greatest demand. A more stable indication of natural-gas expansion is given by the figures on the total customers of the industry.

Residential Customers Near 15 Million

During 1951, natural-gas utility customers averaged 16,141,000, a 13.1 per cent increase over the average of 14,266,900 customers during 1950. The largest gain was in the industrial classification where the total rose 13.6 per cent from 52,700 in 1950 to 61,000 in 1951. Residential customers, which make up most of the industry's connections, rose from 13,083,600 to 14,830,000 in 1951, an increase of 13.3 per cent. The commercial group numbered 1,323,000 during 1951, a 10.1 per cent increase over the 1,119,100 total the previous year.

Besides these three main groups, the American

Gas Association lists an "Others" classification which is mostly government agencies and institutions, such as for example municipal power plants and the Oak Ridge atomic-energy installation. Customers in this group rose sharply in 1951 to 18,000, compared to 10,500 the previous year. Sales to these customers were up 21.6 per cent from 116,000,000,000 cu. ft. in 1950 to 141,000,000,000 cu. ft. in 1951.

Further analysis of the A.G.A. statistics on the natural-gas industry in 1950 shows that the total sold for residential use amounted to 3,630,000,000 cu. ft. daily, and that the average per customer was about 89,000 cu. ft. for the entire year. The average per customer in 1950 was about 85,500 cu. ft.

Natural gas sold to commercial customers aggregated 337,000,000,000 cu. ft. in 1951, an average per customer of 273,000 cu. ft. Daily average sales for commercial customers were 924,000,000 cu. ft. The 2,442,000,000,000 cu. ft. sold to industrial customers during 1951 represented 6,700,000,000 cu. ft. daily and an average per customer of 40,000,000 cu. ft.

Meeting Peak-Load Problem

The perennial problem of the natural-gas industry, and one that has been made more acute with the construction of costly long-distance transmission lines, is that of peak load. This is met to some extent by low-price sales during the warmer months to the large-volume utility users. Figures over the last few years indicate that more and more gas is going to the preferred class of users, namely residences and certain selected industries where gas is the only type of fuel that can be used.

The obvious fact with the natural-gas industry is that its regulated low price has tremendously stimulated demand for the fuel. Much of its load is for space heating where the load factor is under 25 per cent. This expansion has been especially noteworthy in the midwestern and southeastern regions where transmission line costs allow gas to be delivered at a much more favorable differential with competing fuels—oil and coal.

The great increase in the use of underground storage in areas close to major markets is allowing the industry to use its transmission facilities at a much more even year-round rate. Underground reservoirs now or shortly to be in operation will enable the storage of nearly one-sixth of the total annual production of natural gas in the United States. This solution to the peak-load problem has proved a boon to the industry. In addition, it is providing the opportunity for purchase by the transmission companies of much oil-field gas which has been flared to the air.

Depleted gas fields in Pennsylvania and the Mid-Continent are finding increasing use as underground storage projects. The search for suitable storage reservoirs is going on in New Jersey, Pennsylvanian, and even in Texas itself.

The latest survey of the American Gas Association on expenditures on natural-gas facilities indicated that approximately $1,434,000,000 was spent during 1951. Most of this—$995,000,000—went into the construction of new transmission facilities. A total of $129,700,000 was spent on production and storage, and most of the remainder was in distribution.

The year 1951, according to the A.G.A. data, was the record period for capital outlay in the utility natural-gas industry. The total for 1951 compares to the approximately $1,100,000,000 spent in 1950 which was the previous record. Since the end of the war, expenditures for natural-gas facilities have been constantly on the upgrade, rising from $126,300,000 in 1945 to $959,200,000 in 1949. In 1941, by comparison, only $140,000,000 was spent by the entire gas-utility industry.

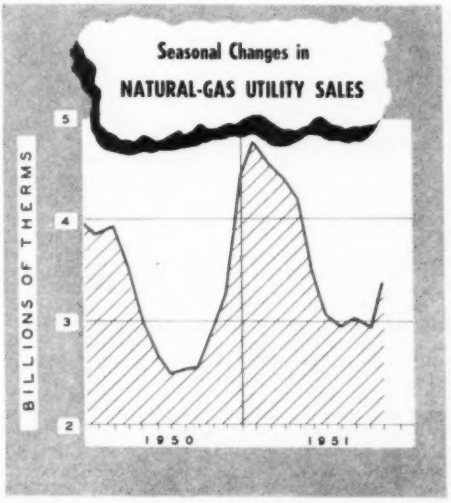
The association's survey forecasts an outlay of $1,205,800,000 for natural-gas facilities in 1952 and shows the total dropping to $636,400,000 in 1953. Of the 1952 expenditures, $773,000,000 is to be spent on transmission. Underground storage will involve an outlay of $37,300,000, other storage $9,100,000, production, $95,100,000, and distribution, $251,900,000. In the past, these forecasts have generally proved conservative, especially for the more distant future years.

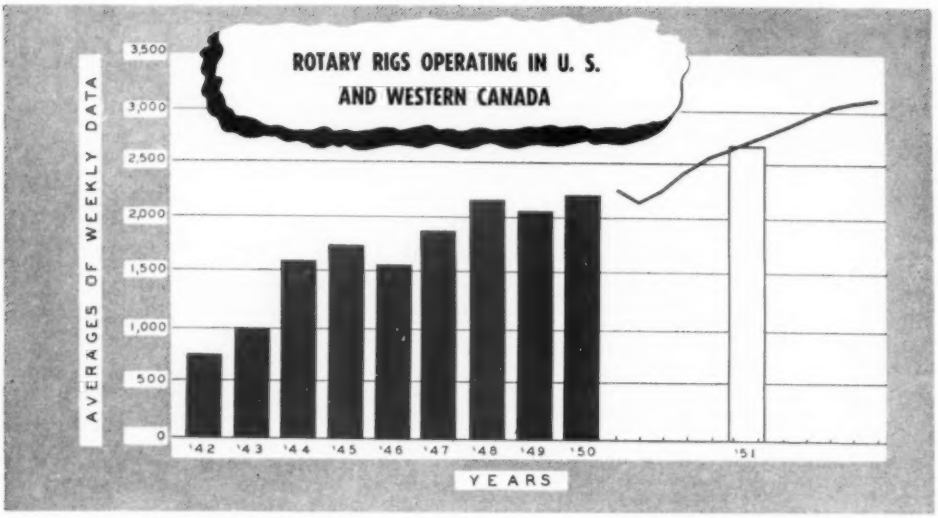
The availability of pipe during the next year or two poses a serious question for the gas as well as the oil industry. C. P. Rather, assistant deputy administrator of the Petroleum Administration for Defense, in a recent speech pointed out that less pipe will probably be available to the gas industry with more going to the oil industry. The reason lies in the fact that several important oil lines were deferred or slowed down while the gas lines were given the green light in order to allow their completion before the winter.

During the fourth quarter of 1951, the total allotment of steel for pipe to PAD was 893,221 tons. Of this amount, gas was allotted 483,296 tons, or 54 per cent. During the third quarter, PAD received an allotment of steel for pipe in the amount of 768,800 tons. Of this, gas was given 517,000 tons, or 67 per cent.

The expansion of the gas-utility industry in this country in recent years has been almost wholly due to the increasing transmission of natural gas. D. A. Hulcy, president of Lone Star Gas Co., Dallas, recently commented in reviewing the industry's record that 15 years ago a leading market expert had strongly recommended the liquidation of securities of the gas industry, so hopeless did he regard its future.

What has happened has been almost the complete opposite of the predictions of the mid-30's. Natural-gas securities today have gained a favored position in the market. The industry has doubled its assets since the end of the war. In 1900 natural gas was providing about 3 per cent of the energy supply of the country. At present, this fuel makes up about 20 per cent of the total energy supply.





Rotary Rigs Operating Again Break Records

Year end saw 660 more units active than number operating at peak in 1950

by Neil Williams

EXPANDED drilling exploration and development work in the United States and western Canada during 1951 brought into operation an unprecedented number of rotary rigs, totaling 3,150 at the peak of activity near the end of the year. Starting the year at record levels up to that time, the number, after a normal seasonal decline in activity during the early months, increased steadily during the remainder of the year. It passed the 1950 all-time peak of more than 2,500 rigs early in May, the 3,000 mark early in October, and the 3,100 figure the middle of November.

The 1951 year-end peak, recorded during the week of December 10, represented an increase of more than 660 rigs over the number in operation at the time of the 1950 record, established during the corresponding week of that year. Following the usual seasonal trend for that time of year, the number had declined slightly by the opening of 1952. It can be expected to drop further through the coming February and into March, due to forced suspension of many operations in some areas because of severe cold or otherwise unfavorable weather conditions.

Increases in drilling activity, however, were recorded during the year in all major regional areas with new records being established in the number of rigs employed in all areas except two, namely, the Illinois-Eastern and Pacific Coast districts. The Illinois area had more than 215 rigs running at its all-time high in 1941. The 1950 peak of 166 rigs during last November was the highest since then. The Pacific Coast 1951 high of 188 rigs was exceeded during May 1949, and also during January 1946, when more than 200 rigs were being operated.

The greatest increase in number of active rigs has been in West Texas, where 1,075 rigs were running at its peak early last December. That total represented a gain of more than 250 rigs during the year, and was 2½ times greater than the number of rigs running in the area 6 years before the end of World War II.

DISTRIBUTION OF ACTIVE ROTARY RIGS
(Peak weeks by years)

Area—	1951* Rigs	1951* Per cent of total	1950* Rigs	1950* Per cent of total	1949* Rigs	1949* Per cent of total
Gulf Coast	667	21.0	603	23.9	539	23.6
W. Tex.-N. M.	1,069	33.6	787	31.2	709	31.0
Ark.-N. La.-E. Tex.	195	6.1	163	6.5	159	7.0
Oklahoma	372	11.7	309	12.3	262	11.5
Kansas-S. Nebraska	203	6.4	161	6.4	144	6.3
Illinois-Eastern	146	4.6	139	5.5	150	6.6
Rocky Mountains	180	5.6	114	4.5	90	3.9
Pacific Coast	179	5.6	132	5.2	148	6.5
Total U. S.	3,021	95.0	2,407	95.5	2,201	96.4
Western Canada	160	5.0	114	4.5	83	3.6
Total	3,181	100.0	2,521	100.0	2,284	100.0

*Peak weeks: 1951, December 10; 1950, December 11; 1949, December 12.

ACTIVE ROTARY RIGS
(Peaks by areas and dates)

	1951 Rigs	1951 Date (mo.-day)	Prior 1951 Rigs	Prior 1951 Date (yr.-mo.)
Gulf Coast	676	12-3	655	1948-12
W. Tex.-N. M.	1,075	12-3	815	1950-10
Ark.-N. La.-E. Tex.	206	12-24	192	1945-12
Oklahoma	379	12-17	323	1950-12
Kansas-S. Nebraska	211	12-17	169	1950-12
Illinois-Eastern	166	7-23	215	1941-9
Rocky Mountains	209	10-15	152	1947-10
Pacific Coast	188	9-24	204	1946-1
Total United States	3,021	12-10	2,407	1950-12
Western Canada	172	12-24	122	1950-10
Total all areas	3,181	12-10	2,521	1950-12

Refining Capacity Scheduled for 3.5 Per Cent Rise

Expansion projects will raise total input capacity to 7,360,000 bbl. daily

by E. B. Tuttle

DURING 1952, crude-oil input capacity of refineries in the United States is scheduled to be stepped up by approximately 150,000 bbl. daily, according to The Oil and Gas Journal's survey of the industry's expansion projects. This increase will provide the nation with a total capacity upwards of 7,360,000 bbl. daily, nearly 3.5 per cent more operable capacity than was available at the beginning of last year.

The Journal survey also shows catalytic cracking for the United States is to be increased by approximately 8 per cent before the end of 1952.

This additional capacity boosts the nation's total to nearly 2,200,000 bbl. daily and includes the various catalytic processes operated to produce motor gasoline, aviation fuels, and blending stocks.

The refining industry's plant-expansion schedule for next year is even larger than for 1952, according to the Journal's survey. Most of the projects scheduled for completion in 1953 have not yet been started since many of them have only recently been authorized. There are a few projects still in the planning stage and some others which will not be announced until later this year. Replies to The Oil and Gas Journal's 1952 survey report long-range plans of operating companies which extend even into 1954.

Based on the survey, crude-oil refining capacity for the United States is estimated to exceed 7,650,000 bbl. daily in 1954. Catalytic cracking capacity for this same period is expected to reach about 2,400,000 bbl. per day, with other plant facilities stepped up proportionately to maintain balance.

A breakdown of refinery-expansion activities in 1952 as reported in the survey show new refineries account for about 10 per cent of the increases, with modernization and enlargement projects providing the remainder. For 1953, new plant capacity is expected to exceed the expansion of existing facilities by 2 to 1. Capacity of new refineries planned and authorized for this period will provide approximately 90,000 bbl. daily crude-oil input.

Completed projects in 1951 increased the nation's crude-oil refining capacity to approximately 7,225,000 bbl. daily. During last year catalytic cracking units and related processes placed on stream, stepped up the industry's capacity to more than 2,000,000 bbl. daily, slightly below a 10 per cent increase over the previous year.

Canada

Expansion of Canada's refining industry involved two new refineries as the major portion of that dominion's program for 1951. Completion of these plants added 16,000 bbl. of daily crude-oil capacity to Canada's total of 424,400 bbl. per day. The Journal survey reports show one 20,000-bbl. per day refinery under construction in Canada and another plant of 15,000 bbl. daily crude-oil rating authorized to be built near Sarnia, Ont. Approximately 25,000 bbl. of additional crude-oil capacity is being currently installed in two other Canadian plants. In addition to this capacity, other increases are to be added as required to maintain plant balance. Canada's capacity for producing lubricants is also being upped this year.

Active Refinery-Building Projects

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
Aetna Oil Co., Louisville:				
Refinery expansion		Building		
New boiler, lb. per hour	36,000	Building	Early '52	Henry Vogt Co.
Alamo Chemical Co., Houston:				
Petrochemical plant		Planned		
American Liberty Oil Co., Mount Pleasant, Tex.:				
Cutback asphalt blender, bbl. per day	650	Building	Mid '52	
Cat. cracker, bbl. per day	5,000	Planned		
Ashland Oil & Refining Co., Buffalo:				
Plant expansion		Building		
Atlantic Refining Co., Port Arthur, Tex.:				
Expand chemical plant, lb. per day	180,000	Building	Late '52	E. B. Badger & Sons Co.; H. R. Ferguson
Atlantic Refining Co., Philadelphia:				
Cat. reformer, bbl. per day	11,000	Building	Early '53	E. B. Badger & Sons Co.
Expand asphalt plant, bbl. per day	325	Authorized	Early '53	
Crude unit, bbl. per day	50,000	Planned	Mid '53	
Cat. cracker, bbl. per day	32,000	Planned	Mid '52	
Alkylation unit, bbl. per day	3,500	Planned	Late '53	
Ammonia plant, tons per day	100	Planned	Mid '53	
Atlas Processing Co., Shreveport:				
Benzene unit, gal. per day	21,000	Building	Early '52	Shell Development Co.; Hudson Engineering Co.
Platformer, bbl. per day	4,400	Building	Early '52	Universal Oil Products Co.; Procon, Inc.
B. A. Shawinigan, Ltd., Montreal, Que., Canada:				
Phenol plant, lb. per year	13,000,000	Building	Late '52	Canadian Kellogg Co., Ltd.
Bay Petroleum Corp., Denver:				
Cat. cracker, bbl. per day	3,528	Building	Early '53	Universal Oil Products Co.; Procon, Inc.
Feed-separation unit				
Bay Petroleum Corp., Chalmette, La.:				
Cat. cracker, bbl. per day	5,640	Building	Early '52	Universal Oil Products Co.; Procon, Inc.
Feed-preparation unit				
British American Oil Co., Ltd., Moose Jaw, Sask., Canada:				
Refinery expansion, bbl. per day	10,000	Building		

Active Refinery-Building Projects (Continued)

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
Cat. cracker, cat. poly, and coking units				
Gas-concentration plant and storage				
British American Oil Co., Ltd., Clarkson, Ont., Canada:				
Grease plant, lb. per year	15,000,000			
Canadian Oil Companies, Ltd., Broomfield, Ont., Canada:				
New refinery, bbl. per day	20,000	Building		Stone & Webster Engr. Corp., Canadian Kellogg Co., Ltd.
Cat. cracker		Building		Universal Oil Products Co.
Platformer		Building		
Carter Oil Co., Salt Lake City:				
New refinery		Planned		
Cities Service Oil Co. (Del.), East Chicago, Ind.:				
Refinery expansion		Planned		
Cities Service Oil Co. (Del.), Cicero, Ill.:				
Grease plant, lb. per year	8,375,000	Building	Mid '52	Sumner S. Sollitt Co.
Cities Service Refining Corp., Lake Charles, La.:				
Hydroformer, bbl. per day	5,000			
Continental Oil Co., Lake Charles, La.:				
Refinery expansion, bbl. per day	40,000	Building	Early '53	Stone & Webster Engr. Corp.; Badger Process Corp.
Platformer				Universal Oil Products Co.; Procon, Inc.
Cosden Petroleum Corp., Big Spring, Tex.:				
Platformer, bbl. per day	3,500	Building	Mid '52	Universal Oil Products Co.; Procon, Inc.
Deep Rock Oil Corp., Cushing, Okla.:				
Lube-oil blending and packaging plant		Building	Early '52	Chemical Plants, Div. of Blaw-Knox Construction Co.
Lube-oil solvent-refining plant, bbl. per day	1,075	Contracted	Early '53	M. W. Kellogg Co.; The Refinery Engineering Co.
Delta Refining Co., Memphis:				
Cat. cracker, bbl. per day	3,000	Building		Koch Engineering Co.
Crude unit, bbl. per day	2,000	Building	Early '52	
Derby Oil Co., Wichita:				
Cat. cracker		Building	Early '52	
Cat. poly unit		Building	Early '52	
Gas-concentration plant		Building	Early '52	
Crude unit		Building	Early '52	
Dominion Tar & Chemical Co., Ltd., Canada:				
Petrochemical plant, lb. per day	40,000			
Dow Chemical Co., Freeport, Tex.:				
Petrochemical plant				
Dow Chemical Co., Midland, Mich.:				
Toluene plant		Planned		Stone & Webster Engr. Corp.
Eastern States Petroleum Co., Inc., Houston:				
Platformer, bbl. per day	4,500	Building		
Increase cat. cracker				
Reactivate alky. unit				
Eldorado Refining Co., Eldorado, Kans.:				
Refinery expansion, bbl. per day	6,000	Authorized		Refinery Engineering Co.
Elk Refining Co., Falling Rock, W. Va.:				
Platformer, bbl. per day	1,500	Building		Universal Oil Products Co.
Esso Standard Oil Co., Bayway, N. J.:				
Boiler feed-water treater		Building	Early '52	Dravo Corp.
Desalting units (2), bbl. per day	50,000	Building		Fluor Corp., Ltd.
Esso Standard Oil Co., Bayonne, N. J.:				
Atmospheric unit, bbl. per day	28,500	Building	Late '52	The Lummus Co.
Esso Standard Oil Co., Everett, Mass.:				
Cat. cracker, bbl. per day	18,500	Building	1953	Foster Wheeler Corp.
Rerun still, bbl. per day	7,000	Building	1952	
Esso Standard Oil Co., Baton Rouge:				
Crude still, bbl. per day	60,000	Building	1953	M. W. Kellogg Co.
Expand cat. cracker		Building	1953	
Expand crude unit		Building	1953	
Esso Standard Oil Co., Baltimore:				
Crude desalter, bbl. per day	60,000	Building	Mid '52	M. W. Kellogg Co.
E. I. du Pont de Nemours & Co., Inc., Beaumont, Tex.:				
Petrochemical plant		Planned		
Farmers Union Central Exchange, Inc., Laurel, Mont.:				
Cat. cracker, bbl. per day	5,000	Building	Mid '52	Universal Oil Products Co.; Refinery Engineering Co.
Poly unit, bbl. per day	300	Building	Mid '52	Universal Oil Products Co.; Refinery Engineering Co.
General Petroleum Corp., Torrance, Calif.:				
Cat. cracker		Planned		
Gilmore Refineries, Inc., Odessa, Tex.:				
New refinery, bbl. per day	50,000			
Great Northern Oil Co., St. Paul:				
Crude unit, bbl. per day	30,000			
Cat. cracker, bbl. per day	7,500			
Alky. unit, bbl. per day	2,500			
Cat. reformer, bbl. per day	6,000			
Cat. poly unit, bbl. per day	700			
Gulf Oil Corp., Philadelphia:				
Cat. cracker, bbl. per day	63,000	Contracted	Mid '53	M. W. Kellogg Co.
Distillation unit, bbl. per day	125,000	Contracted	Late '52	Foster Wheeler Corp.
Cat. reformer, bbl. per day	10,000	Planned	Mid '53	
Gasoline sweetening unit, bbl. per day	40,000	Building	Mid '53	
Gulf Oil Corp., Cincinnati:				
Packaging and blending plant		Planned		
Gulf Oil Corp., Port Arthur, Tex.:				
Sulfur plant, tons per day	60	Contracted	Late '52	Ralph M. Parsons Co.

Active Refinery-Building Projects (Continued)

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
Isooctyl alcohol facilities		Building	Late '52	
Ethylene plant, tons per day	250	Building	Early '52	The Lummus Co.
Sludge decomposition acid unit, bbl. per day	300	Planned	Late '52	
Heyden Chemical Corp., Houston:				
Methanol plant		Authorized		
Imperial Oil, Ltd., Edmonton, Alta., Canada:				
Cat. cracker, bbl. per day	10,000	Building	Early '52	Foster Wheeler Corp.
Vacuum unit, bbl. per day	10,000	Building	Early '52	
Imperial Oil, Ltd., Sarnia, Ont., Canada:				
Refinery expansion, bbl. per day	15,000			
Cat. cracker, bbl. per day	25,000	Contracted		Canadian Kellogg Co., Ltd.
International Refineries, Inc., Wrenshall, Minn.:				
New refinery, bbl. per day	11,500	Building	Late '52	Lummus Co.
Cat. cracker				
Kanotex Refining Co., Arkansas City, Kans.:				
Vacuum unit, bbl. per day	5,750	Building	Late '52	Refinery Engineering Co.
Cat. cracker, bbl. per day	4,600	Building	Late '52	Refinery Engineering Co.
Kendall Refining Co., Bradford, Pa.:				
Desalting unit, bbl. per day	5,000	Building		
Koppers Co., Port Arthur, Tex.:				
Petrochemical plant		Building		
Magnolia Petroleum Co., Beaumont, Tex.:				
Feed-preparation unit		Building	Mid '52	
Mercury Oil Refining Co., Oklahoma City:				
Refinery expansion, bbl. per day	7,000	Building	Late '53	Refinery Engineering Co.
Cat. cracker				
Poly unit				
National Coop. Refinery Assn., McPherson, Kans.:				
Cat. cracker, bbl. per day	10,000	Building		Refinery Engineering Co.
Cat. poly unit, bbl. per day	600	Building		Refinery Engineering Co.
Increase crude unit, bbl. per day	3,000	Building		Refinery Engineering Co.
Revamp vacuum unit		Building		Refinery Engineering Co.
Revamp thermal cracker		Building		Refinery Engineering Co.
Northwestern Refining Co., St. Paul Park, Minn.:				
Cat. cracker, bbl. per day	7,500	Building	Late '52	Universal Oil Products Co.; Procon, Inc.
Ohio Oil Co., Robinson, Ill.:				
Coking unit, bbl. per day	6,000	Contracted		The Lummus Co.
Alkylation unit, bbl. per day	1,500	Planned		
Cat. reformer, bbl. per day	7,000	Planned		
Old Dutch Refining Co., Muskegon, Mich.:				
Refinery increase, bbl. per day	7,500	Building	Early '52	Universal Oil Products Co.
Platformer increase, bbl. per day	1,200	Building	Early '52	Universal Oil Products Co.
Pan American Refining Corp., Texas City, Tex.:				
Cat. cracker, bbl. per day	30,000	Contracted	1953	The Lummus Co.
Cat. poly unit, bbl. per day	800	Contracted	1953	The Lummus Co.
Pan-Am Southern Corp., El Dorado, Ark.:				
Petrochemical plant, gal. per year	2,000,000	Contracted	Early '52	
Pan-Am Southern Corp., Destrehan, La.:				
Hydroformer, bbl. per day	2,000	Building		M. W. Kellogg Co.
Panhandle Producing & Refining Co., Wichita Falls, Tex.:				
Crude unit, bbl. per day	8,000	Building	Mid '52	
Petroleum Specialties, Inc., Flat Rock, Mich.:				
Platformer, bbl. per day	900	Building	Early '52	Universal Oil Products Co.
Cat. cracker		Planned		
Phillips Oil Co., Okmulgee, Okla.:				
Cat. cracker, bbl. per day	8,000	Building	Mid '52	Fluor Corp., Ltd.
Phillips Petroleum Co., Woods Cross, Utah:				
Cat. cracker, bbl. per day	8,000	Building	Late '52	Fluor Corp., Ltd.
Pure Oil Co., Smiths Bluff, Tex.:				
Cat. cracker		Contracted	Early '53	M. W. Kellogg Co.
Cat. poly unit		Contracted	Early '53	M. W. Kellogg Co.
Expand alky. unit		Contracted	Early '53	M. W. Kellogg Co.
Pure Oil Co., Toledo:				
Cat. cracker		Contracted	Early '53	M. W. Kellogg Co.
Cat. poly unit		Contracted	Early '53	M. W. Kellogg Co.
R. J. Oil & Refining Co., Inc., Princeton, Ind.:				
Platformer, bbl. per day	750	Building	Late '52	Universal Oil Products Co.
Richfield Oil Corp., Watson, Calif.:				
Cat. cracker		Planned		
Feed-preparation unit		Planned		
Roosevelt O. & R. Corp., Mount Pleasant, Mich.:				
Platformer, bbl. per day	1,800	Building	Mid '52	Universal Oil Products Co.; Procon, Inc.
Platreater, bbl. per day	450	Building	Mid '52	Universal Oil Products Co.; Procon, Inc.
Udex unit, bbl. per day	1,200	Building	Mid '52	Universal Oil Products Co.; Procon, Inc.
Salt Lake Refining Co., Salt Lake City.:				
Vacuum unit, bbl. per day	9,500	Building		Bechtel Corp.
Shallow Water Refining Co., Shallow Water, Kans.:				
Residuum vacuum unit, bbl. per day	500	Building	Early '52	
Shamrock Oil & Gas Corp., Sunray, Tex.:				
Continuous contact coking unit, bbl. per day	1,000	Building	Mid '52	Lummus Co.
Shell Chemical Co., Houston:				
Ethyl chloride plant		Building		
Sulfur plant, tons per year	13,000	Building	Mid '52	Ralph M. Parsons Co.
Shell Chemical Co., Ventura, Calif.:				
Petrochemical plant, tons per day	150	Planned	Mid '53	
Shell Oil Co. of Canada, Ltd., Montreal, Que., Canada:				
Alcohol plant, tons per year	10,000	Building		C. F. Braun Co.

Active Refinery-Building Projects (Continued)

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
Shell Oil Co., Norco, La.:				
Refinery expansion, bbl. per day	25,000	Authorized		
Cat. cracker		Authorized		
Shell Oil Co., Wood River, Ill.:				
Expand refinery, bbl. per day	50,000			
Sinclair Refining Co., East Chicago, Ind.:				
Vacuum still, bbl. per day	20,000	Building	Mid '52	Arthur G. McKee Co.
Sinclair Refining Co., Wood River, Ill.:				
Sulfur dioxide treater, bbl. per day	10,000	Building	Late '52	Stone & Webster Engr. Corp.
Sinclair Refining Co., Marcus Hook, Pa.:				
Sulfur plant, tons per day	21	Building	Late '52	Ralph M. Parsons Co.
Sinclair Refining Co., Wellsville, N. Y.:				
Propane deasphalting unit		Planned		
Sinclair Refining Co., Houston:				
Cat. cracker, bbl. per day	40,000	Contracted	Late '53	C. F. Braun Co.
Distillation unit, bbl. per day	35,000			Fluor Corp., Ltd.
Sid Richardson Refining Co., Texas City, Tex.:				
Refinery modernization		Building	Early '52	
Skelly Oil Co., Longview, Tex.:				
Platformer, bbl. per day	1,500	Building	Early '52	Universal Oil Products Co.
Cat. poly unit				
Expand refinery				
Socony-Vacuum Oil Co., Inc.:				
Cat. cracker, bbl. per day	15,000	Building	1952	
Standard Oil Co. of California, El Segundo, Calif.:				
Platformer, bbl. per day	10,000	Building		Universal Oil Products Co.
Benzene facilities, bbl. per day	850	Building	Mid '52	Fluor Corp., Ltd.
Toluene facilities, bbl. per day	3,200	Building		Fluor Corp., Ltd.
Standard Oil Co. of California, Richmond, Calif.:				
Vacuum unit, bbl. per day	50,000			
Isobutane facilities				
Expand alkane facilities, bbl. per day	3,000	Contracted		Bechtel Corp.
Standard Oil Co. (Ind.), Neodesha, Kans.:				
Expand crude units, bbl. per day	9,300	Building	1952	Foster Wheeler Corp.
Standard Oil Co. (Ind.), Sugar Creek, Mo.:				
Expand crude units, bbl. per day	30,000	Building	1952	Lummus Co.
Standard Oil Co. (Ind.), Whiting, Ind.:				
Benzene facilities, bbl. per day	1,070	Building	1952	
Sulfur plant, tons per day	50	Building	1952	Fluor Corp.
Standard Oil Co. (Ind.), Wood River, Ill.:				
Alcohol plant, lb. per year	10,000,000	Contracted	1952	M. W. Kellogg Co.
Standard Oil Co. (Ohio), Cleveland:				
Crude units, bbl. per day	50,000	Building	Mid '52	Arthur G. McKee Co.
Standard Oil Co. (Ohio), Lima, Ohio:				
Expand cat. cracker, bbl. per day	27,000	Building	Mid '52	Arthur G. McKee Co.
Cat. reformer, bbl. per day	15,000	Contracted	Early '54	Lummus Co.
Revamp crude coker, bbl. per day	30,000	Contracted	Early '53	Lummus Co.
Standard Oil Co. (Ohio), Toledo:				
Alkylation unit, bbl. per day	3,000	Planned	1953	
Standard Oil Co. of Texas, El Paso, Tex.:				
Cat. unit, bbl. per day	10,400	Building	Mid '52	Catalytic Construction Co.; Houdry Process Corp.; M. W. Kellogg Co.
Vacuum unit, bbl. per day	5,200	Building	Mid '52	
Alkylation unit, bbl. per day	940	Building	Mid '52	
Vapor-recovery plant		Building	Mid '52	
Sun Oil Co., Marcus Hook, Pa.:				
Houdriformer, bbl. per day	11,000	Building	Late '52	
Sun Oil Co., Sarnia, Ont., Canada:				
New refinery, bbl. per day	15,000	Authorized		
Sunray Oil Corp., Corpus Christi, Tex.:				
New refinery, bbl. per day	25,000	Planned		
Sunray Oil Corp., Duncan, Okla.:				
Rehabilitate alky. unit, bbl. per day	2,100	Contracted	Mid '52	The Refinery Eng. Co.
Sunset Oil Co., Los Angeles:				
Thermal cracker, bbl. per day	2,500	Contracted	Early '52	Gosselin & Clark
Cat. poly unit, bbl. per day	300	Contracted	Early '52	Gosselin & Clark
Taylor Refining Co., Corpus Christi, Tex.:				
Aromatics facilities, bbl. per day	1,200	Planned		
Taylor Refining Co., Port Isabel, Tex.:				
Propane and L.P.G. recovery facilities, bbl. per day	600	Planned		
The Texas Co., Port Arthur, Tex.:				
Increase crude capacity, bbl. per day	20,000	Building	Early '52	
Increase steam facilities, lb. per hour	225,000	Building	Early '52	Foster Wheeler Corp.
The Texas Co., Westville, N. J.:				
Desalting unit, bbl. per day	60,000	Planned	Early '53	
The Texas Co., Lockport, Ill.:				
Increase refinery capacity—				
Alter crude units		Planned	Early '54	
Atmospheric vacuum unit		Planned	Early '54	
Furfural refining unit		Planned	Early '54	
Solvent-dewaxing unit		Planned	Early '54	
Contact filter plant		Planned	Early '54	
Propane deasphalting unit		Planned	Early '54	
Percolation filter unit		Planned	Early '54	
Compounding and packaging		Planned	Early '54	
Tide Water Associated Oil Co., Drumright, Okla.:				
Crude unit, bbl. per day	15,000	Contracted	Late '52	Born Engineering Co.
Union Oil Co. of California, Wilmington, Calif.:				
Cat. cracker, bbl. per day	28,500	Building	Mid '52	Arthur G. McKee Co.
Revision to cat. cracker				Arthur G. McKee Co.
Crude units, bbl. per day	40,000	Building	Late '52	Fluor Corp.

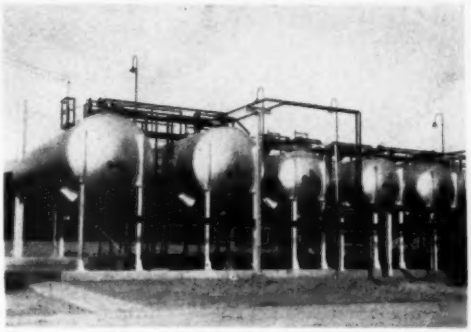
GASOLINE — DIESEL FUEL — BURNING OILS

All Stored in Horton Tanks at Conoco's Billings Refinery

The Continental Oil Company has incorporated many modern refining procedures and storage methods in its 7500 barrel-per-day refinery near Billings, Montana.

Pictured above are a group of Horton storage tanks that are designed to reduce the evaporation of volatile hydrocarbons. Here are tanks equipped with Horton Floating Roofs for working storage — a 10,000-bbl. Hortonspheroid for large capacity pressure storage — and Horton flat-bottom tanks for heavier fuel oil storage. Each of the units has been fabricated and erected to utilize the most efficient storage principles known. The resulting savings are evident.

More complete information on Hortonspheres, Hortonspheroids, Hemispheroids, Horton Pan, Pontoon or Double-Deck Floating Roofs, Hortondome Roofs or other steel plate structures may be obtained by writing our nearest office. There is no obligation on your part.



Two 10-ft. diam. by 35-ft. 6-in. and three 8-ft. diam. by 53-ft. 3-in. Horton horizontal pressure vessels at the Continental Oil Company refinery in Billings, Mont.

CHICAGO BRIDGE & IRON COMPANY

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Atlanta, 3.....2154 Healey Bldg.
Birmingham, 1.....1536 North 50th St.
Boston, 10.....1025—201 Devonshire St.
Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 C & I Life Bldg.
Los Angeles, 17....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
Philadelphia, 3...1615—1700 Walnut Street Bldg.
San Francisco, 4.....1554—200 Bush St.
Seattle, 1.....1325 Henry Bldg.
Tulsa, 3.....1606 Hunt Bldg.
Washington 6, D. C.....1139 Cafritz Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
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Constructions Metalliques de Provence, Arles-sur-Rhone, France
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Comprimo N.V., Amsterdam—O, Netherlands
Compagnia Tecnica Industrie Petroli, Rome, Italy
Whessoe, Limited, Darlington, England
Motherwell Bridge & Engineering Company, Limited, Motherwell, Scotland
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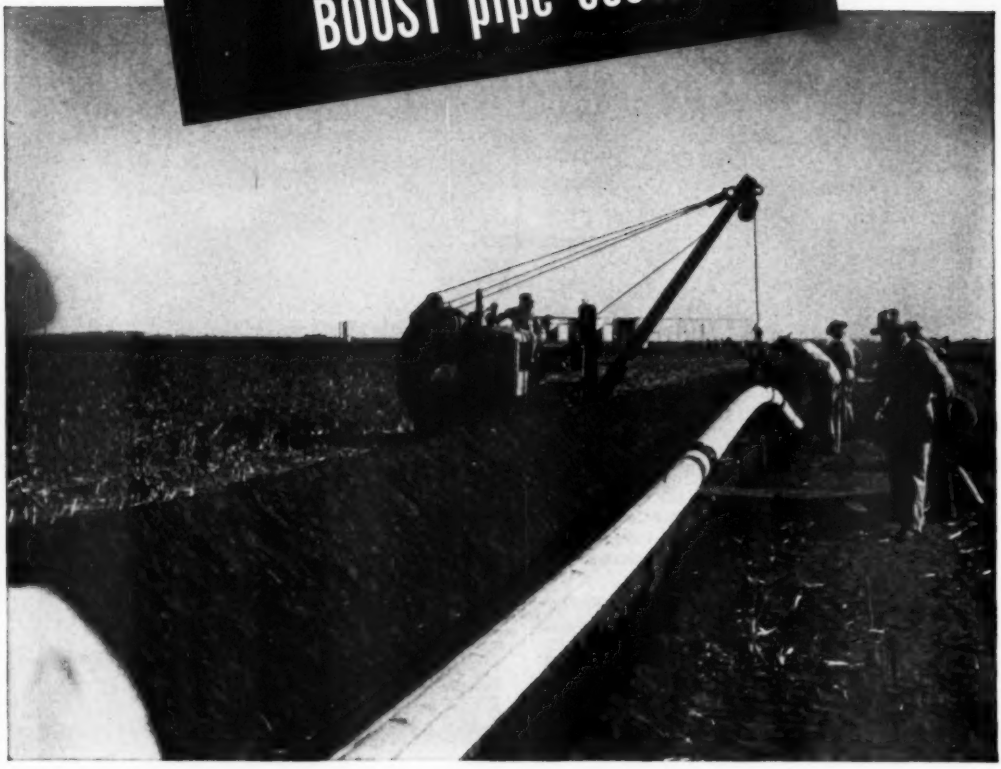
Don't let "TAGALONG" metal BOOST pipe costs



You can usually find the exact wall thicknesses and diameters you need for line pipe jobs when you specify Armco Steel Pipe. This makes it easy to avoid paying for costly and useless "tagalong" metal, not warranted by job requirements.

With Armco Pipe you have a choice of 10 wall thicknesses between $\frac{9}{64}$- and $\frac{1}{2}$-inch in 20 diameters from 6 to 36 inches.

In addition, you gain the installation economies of lengths up to 50 feet. This means fewer sections to haul and handle and fewer field joints. Even these go together quickly as the specially-prepared ends simplify and speed field welding.

Besides economy, Armco Steel Pipe provides exceptional strength and flexibility. Slack loops and cold bends are no problem.

These are only a few reasons why you gain by specifying Armco Steel Pipe for gathering systems, line pipe and wherever else you need dependable piping. Write us for data applied to your specific needs. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1242 Curtis Street, Middletown, Ohio. 201 KOME Building, Tulsa, Oklahoma. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO

ARMCO WELDED STEEL PIPE

Active Refinery-Building Projects (Continued)

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
Hydrogen sulfide-recovery system		Building	Mid '52	Girdler Corp.; Ralph M. Parsons Co.
Addition to boiler plant and revision to steam system		Building	Late '52	C. C. More & Co.
Acid treater and rerun column, bbl. per day	15,000	Building	Late '52	C. F. Braun Co.
Revision to thermal cracker		Building	Mid '52	Fluor Corp., Ltd.
Additions and revisions to treating unit		Building	Mid '52	Ralph M. Parsons Co.
Sulfur plant, tons per day	50	Building	Late '52	Ralph M. Parsons Co.
Ammonium sulfate plant, tons per day	50	Building	Early '53	Ehrhart & Arthur
Union Oil Co. of California, Rodeo, Calif.:				
Modernize asphalt plant, tons per day	780	Building	Late '53	Ehrhart & Arthur
Utah Oil Refining Co., Salt Lake City:				
Increase boiler plant, lb. per hour	65,000	Building	Early '52	Stearns-Roger Mfg. Co.
Naphtha stabilizer, bbl. per day	8,000	Building	Early '52	
Wilcox Oil Co., Bristow, Okla.:				
Platformer, bbl. per day	1,500	Building	Mid '52	Universal Oil Products Co.; Procon, Inc.
Wood River Oil & Refining Co., Calumet City, Ill.:				
New refinery, bbl. per day	15,000			
Cat. cracker, bbl. per day	6,800			

Refinery Projects Completed in 1951

Company, location, and type of project—	Capacity rating
American Liberty Oil Co., Mt. Pleasant, Tex.:	
Crude prefractionator, bbl. per day	2,000
American Liberty Oil Co., Winnsboro, Tex.:	
Vacuum unit, bbl. per day	1,000
Atlantic Refining Co., Port Arthur, Tex.:	
Improve cat. cracker feed facilities, bbl. per day	7,000
Aurora Gasoline Co., Detroit:	
Platformer, bbl. per day	4,500
Bell Oil & Gas Co., Grandfield, Okla.:	
Platformer, bbl. per day	1,500
British American Oil Co., Ltd., Edmonton, Alta., Canada:	
New refinery, bbl. per day	5,200
California Refining Co., Perth Amboy, N. J.:	
Cat. cracker, bbl. per day	25,000
Reformer, bbl. per day	10,000
Alkylation unit, bbl. per day	5,000
Crude units, bbl. per day	50,000
Gasoline treater, bbl. per day	20,000
Cities Service Oil Co. (Del.), Ponca City, Okla.:	
Cat. cracker, bbl. per day	10,000
Col-Tex Refining Co., Colorado City, Tex.:	
Cat. poly unit, bbl. per day	80
Cosden Petroleum Corp., Big Spring, Tex.:	
Crude unit, bbl. per day	4,000
Canadian Oil Companies, Ltd., Toronto, Ont., Canada:	
Lube-oil plant	
Excelsior Refineries, Ltd., Lloydminster, Alta., Canada:	
Vacuum unit, bbl. per day	1,700
Fletcher Oil Co., Wilmington, Calif.:	
Capacity increase, bbl. per day	5,000
Expand thermal cracker, bbl. per day	1,400
Expand poly unit, bbl. per day	25
Gulf Oil Corp., Port Arthur, Tex.:	
Cat. cracker, bbl. per day	60,000
Feed-preparation unit, bbl. per day	26,000
Humble Oil & Refining Co., Baytown, Tex.:	
Crude unit, bbl. per day	70,000
Imperial Oil, Ltd., Winnipeg, Man., Canada:	
New refinery, bbl. per day	10,800
Johnson Oil Refining Co., Cleveland, Okla.:	
Platformer, bbl. per day	1,800
Kendall Refining Co., Bradford, Pa.:	
Platformer, bbl. per day	1,200
Louisville Refining Co., Louisville:	
Cat. cracker, bbl. per day	3,000
McColl-Frontenac Oil Co., Ltd., Edmonton, Alta., Canada:	
Cat. cracker, bbl. per day	2,600
Distillation unit, bbl. per day	5,500
Delayed coker, bbl. per day	2,200
Poly unit, bbl. per day	250
McColl-Frontenac Oil Co., Ltd., Montreal, Que., Canada:	
Expand poly unit, bbl. per day	500
Magnolia Petroleum Co., Beaumont, Tex.:	
Convert cat. units	
Matheson Hydrocarbon Chemical Co., Brandenburg, Ky.:	
Petrochemical plant	
Mexican Petroleum Corp., Wilmington, N. C.:	
Asphalt plant	
Mid West Refineries, Inc., Alma, Mich.:	
Platformer	
Refinery increase	
New Mexico Asphalt & Refining Co., Artesia, N. M.:	
Cat. cracker, bbl. per day	6,000
Cat. poly unit, bbl. per day	300
Onyx Refining Co., Abilene, Tex.:	
Platformer, bbl. per day	600
Revamp topping unit, bbl. per day	5,500
Oriental Refining Co., Denver:	
Cycloversion unit, bbl. per day	1,500
Pacific Refiners, Ltd., Hawaii:	
Asphalt plant, bbl. per day	3,000
Pana Refining Co., Pana, Ill.:	
Cat. poly unit, bbl. per day	77
Petroleum Specialties, Inc., Flat Rock, Mich.:	
Increase crude unit, bbl. per day	1,000
Phillips Petroleum Co., Phillips, Tex.:	
Cat. cracker, bbl. per day	30,000
Sulfur dioxide extraction unit, bbl. per day	20,000
Phillips Oil Co., Sweeney, Tex.:	
Alkylation unit, bbl. per day	3,500
Crude unit, bbl. per day	30,000
Premier Petroleum Co., Fort Worth:	
Platformer, bbl. per day	1,500
R. J. Oil & Refining Co., Inc., Princeton, Ind.:	
Crude unit, bbl. per day	2,000
Saskatchewan Federated Coop., Ltd., Regina, Sask., Canada:	
Expand crude unit, bbl. per day	3,500
Expand thermal cracker, bbl. per day	1,500
Shallow Water Refining Co., Shallow Water, Kans.:	
Cat. poly unit, bbl. per day	50
Shell Oil Co., Houston:	
Platformer, bbl. per day	15,000
Shell Oil Co., Wood River, Ill.:	
Platformer, bbl. per day	15,000
Shell Oil Co., Wood River, Ill.:	
Benzene plant	
Shamrock Oil & Gas Co., Sunray, Tex.:	
Houdriformer	
Sinclair Refining Co., Houston:	
Desalting unit, bbl. per day	37,000
Socony-Vacuum Oil Co., Inc.:	
Brooklyn—	
Buffalo—	
East Chicago—	
Revamp crude units, bbl. per day	26,000
Thermal reformer, bbl. per day	12,000
Treating unit, bbl. per day	3,000
Cat. poly unit, bbl. per day	1,800
Naphtha rerun unit, bbl. per day	15,000
Convert cat. crackers, bbl. per day	90,000
Standard Oil Co. of California, Richmond, Calif.:	
Vacuum unit, bbl. per day	50,000
Standard Oil Co. (Ohio), Cleveland:	
Cat. cracker, bbl. per day	18,000
Sunray Oil Corp., Duncan, Okla.:	
Reactivate Rock Island refinery, bbl. per day	10,000
Taylor Refining Co., Pt. Isabel, Texas:	
Crude unit, bbl. per day	16,000
Platformer, bbl. per day	4,000
Taylor Refining Co., Corpus Christi, Tex.:	
Crude unit, bbl. per day	26,000
Cat. cracker, bbl. per day	8,000
The Texas Co., Lawrenceville, Ill.:	
Increase refinery, bbl. per day	20,000
Cat. cracker	
Cat. poly unit	
Union Oil Co., Edmonds, Wash.:	
Asphalt plant, tons per year	65,000
Wickett Refining Co., Wickett, Tex.:	
Thermal cracker, bbl. per day	1,200
Reformer, bbl. per day	800
Wilshire Oil Co., Inc., Norwalk, Calif.:	
Cat. cracker, bbl. per day	5,500
Vacuum unit, bbl. per day	15,000

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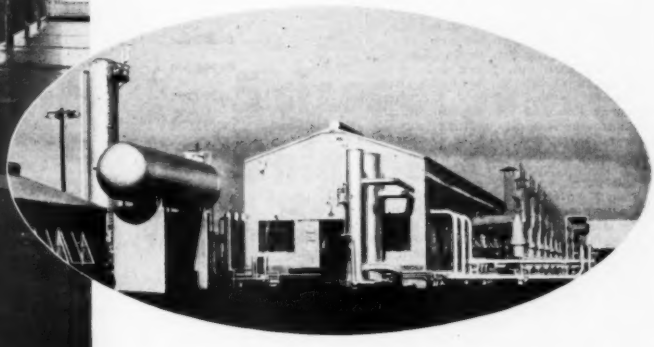
Here you have the reasons why Shell and so many other companies are taking advantage of the latest developments in Cooper-Bessemer V-Angle design. The emphasis is on *big savings*, combined with the smooth dependability long demonstrated by these modern V-Angle units.



Line-up of supercharged 10-cylinder, 1,350 hp GMV units in the Elk City field's compressor house, shown in insert. Here, dry gas from the absorber is compressed in 2 stages from 875 psi to 4,400 psi for return to the formation. Efficiency and conservation are keynotes in the over-all operations of the completely unitized Elk City field.

by **Cooper-Bessemer**

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Field Processing Slated for Big Boost

Input capacity increase should hit 1.3 billion cubic feet daily during current year

by R. B. Tuttle

ACCORDING to The Oil and Gas Journal's 1952 survey of the natural-gas processing industry, field processing facilities in the United States are scheduled for input capacity increases of about 1.3 billion cubic feet daily this year. This increase is made up of new plants and expansions to existing facilities in various sections of the country.

Completion schedules on these different major projects run through this year and into 1953. There are 33 projects definitely set for 1952 completion and 7 scheduled for probable completion in the same period. Next year's schedules call for completion of 10 projects, 5 of which are definitely slated to go on stream before the end of 1953.

The petrochemical branch of the natural-gas processing industry includes four major plant-construction projects which involve a total output capacity of more than 100 tons daily. This includes two sulfur plants, an alcohol plant, and one specialty-products plant.

Various other construction projects involving plants for field processing natural gas, now under way and scheduled, incorporate some comparatively important installations. These projects include treating units and compression equipment.

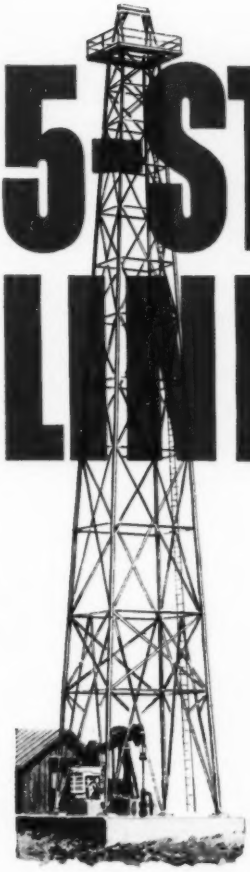
New plants and additions to existing plants placed in service during 1951 boosted the nation's natural-gas processing capacity by 1.2 billion cubic feet daily. The 10 new natural-gas plants placed in operation last year have a combined capacity input rating of nearly 1 billion cubic feet per day.

Still in the planning stage are six major projects which have only recently been announced. These include two new gasoline plants, one cycling plant, one large compressor plant, and two plant-enlargement programs. A number of projects still in the preliminary planning stage have not yet been announced. These plus the announced projects indicate the industry is continuing its program of expansion into 1953.

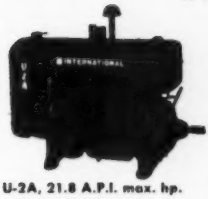
Natural-Gas Processing-Plant Projects

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
American Republics Corp., Hardin County, Texas:				
Remote absorber, cu. ft. per day	30,000,000	Building	Early '52	
Anchor Gasoline Corp., Midland, Tex.:				
New gasoline plant		Building		
Anchor Gasoline Corp., North Tepetate, La.:				
New gasoline plant		Planned		
Arkansas Fuel Oil Co., Haughton, La.:				
Plant increase, cu. ft. per day	60,000,000	Building	Late '52	
Arkansas Fuel Oil Co., Heflin, La.:				
Plant increase, cu. ft. per day	60,000,000	Building	Late '52	
Arkansas Fuel Oil Co., Magnolia, Ark.:				
Increase propane recovery, cu. ft. per day	100,000,000	Building	Late '52	
Claiborne Gasoline Co., Lisbon, La.:				
Compressor station, cu. ft. per day	9,000,000	Building	Early '52	Petroleum Engineering Co.
Colorado Interstate Gas Co., Dumas, Tex.:				
New gasoline plant		Planned		
Del Rey Petroleum Co., Eagle Lake, Tex.:				
Plant increase, cu. ft. per day	40,000,000	Contracted		O. L. Olson Co.
El Paso Natural Gas Co., Lea County, New Mexico:				
Purification and dehydration plant, cu. ft. per day	80,000,000	Building	Early '52	
New gasoline plant, cu. ft. per day	85,000,000	Building	Early '52	Fluor Corp.
El Paso Natural Gas Co., Midland County, Texas:				
Purification and dehydration plant, cu. ft. per day	10,000,000	Building	Early '52	
Gulf Oil Corp., Crane County, Texas:				
Sulfur plant, tons per day	20	Building	Early '52	Graff Engr. & Equip. Co.
Gulf Oil Corp., St. Landry Parish, Louisiana:				
New cycling plant		Planned		
Honolulu Oil Corp., Taft, Calif.:				
Plant additions, cu. ft. per day	8,000,000	Building	Early '52	J. B. Gill Co.
Honolulu Oil Corp., Ropes field, Texas:				
Compressor plant, cu. ft. per day	1,700,000	Planned	Late '52	
Hugoton Production Co., Ulysses, Kans.:				
Increase plant capacity, gal. per day	90,000	Building		
Humble Oil & Refining Co., Galveston County, Texas:				
Increase compressor capacity, cu. ft. per day	8,300,000	Building	Early '52	Gasoline Plant Const. Corp.
Humble Oil & Refining Co., Atascosa County, Texas:				
Increase compressor capacity, cu. ft. per day	2,000,000	Building	Early '52	Hudson Engineering Corp.
Humble Oil & Gas Co., Refugio County, Texas:				
Increase compressor capacity, cu. ft. per day	40,000,000	Building	Early '52	Stearns-Roger Mfg. Corp.
Lone Star Gas Co. and Lone Star Production Co., Springtown, Tex.:				
Desulfurization unit, cu. ft. per day	10,000,000	Building		R. A. Graff
Magnolia Petroleum Co., Pegasus field, Texas:				
New gasoline plant, cu. ft. per day	30,000,000	Building	Late '52	Hudson Engr. Corp.
Magnolia Petroleum Co., Longville, La.:				
New gasoline plant, cu. ft. per day	3,100,000	Building	Mid '52	Blaw-Knox Const. Co.
Magnolia Petroleum Co., Clayton field, Texas:				
Separation and dehydration, cu. ft. per day	47,500,000	Building	Mid '52	Delta Engineering Corp.
National Petro-Chemicals Corp., Tuscola, Ill.:				
Alcohol plant		Building		

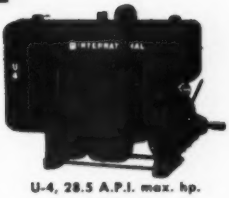
5-STAR LINE-UP



U-1, 10.5 A.P.I. max. hp. at 1800 r.p.m.

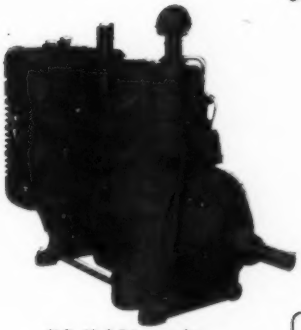


U-2A, 21.8 A.P.I. max. hp. at 1800 r.p.m.



U-4, 28.5 A.P.I. max. hp. at 1800 r.p.m.

U-6, 37.5 A.P.I. max. hp. at 1500 r.p.m.



U-9, 49 A.P.I. max. hp. at 1500 r.p.m.

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Natural-Gas Processing-Plant Projects (Continued)

Company, location, and type of project—	Capacity rating	Status	Comp. schedule	Contractors
Ohio Oil Co., Bay City, Tex.:				
Natural-gas processing plant, cu. ft. per day	91,000,000	Building	Early '52	Hudson Engineering Corp.
Pecos Petroleum Co., Pecos, Tex.:				
Plant increase, gal. per day	22,000	Building		
Phillips Petroleum Co., Midland County, Texas:				
Natural gasoline plant, cu. ft. per day	60,000,000	Building	Late '52	
Phillips Petroleum Co., Ector County, Texas:				
Plant increase, cu. ft. per day	75,000,000	Contracted	Early '53	
Phillips Petroleum Co., Upton County, Texas:				
Gasoline plant, cu. ft. per day	60,000,000	Contracted	Mid '53	
Gasoline plant, cu. ft. per day	55,000,000	Contracted	Mid '53	
Plymouth Oil Co., Tom Greene County, Texas:				
Repressure and gas-lift plant, cu. ft. per day	3,000,000	Building	Early '52	Hudson Engineering Corp.
Royalite Oil Co., Ltd., Turner Valley, Alberta:				
Sulfur plant, tons per day	30	Contracted		Foster Wheeler, Ltd.
Shell Oil Co., Notrees, Tex.:				
Plant increase, cu. ft. per day	22,000,000	Building	Early '52	Dresser Engr. Co.
Shell Oil Co., Denver City, Tex.:				
Plant increase, cu. ft. per day	16,000,000	Planned		
Shell Oil Co., Elk City, Okla.:				
Plant increase, cu. ft. per day	50,000,000	Building	Mid '52	Fluor Corp., Ltd.
Skelly Oil Co., Velma, Okla.:				
Plant increase, cu. ft. per day	35,000,000			
Signal Oil & Gas Co., Long Beach, Calif.:				
Plant increase				
Signal Oil & Gas Co., Huntington Beach, Calif.:				
Plant increase				
Standard Oil Co. of California, Operator, Elk Hills, Calif.:				
Natural-gasoline and repressuring plant, cu. ft. per day	50,000,000	Building	Late '52	Parsons-Macco Co.
Plant addition, cu. ft. per day	40,000,000			
Stanolind Oil & Gas Co., Grant County, Texas:				
Plant increase, cu. ft. per day	200,000,000	Building	Early '52	Stearns-Roger Mfg. Co.
Stanolind Oil & Gas Co., Bee County, Texas:				
Plant addition, gal. per day	27,000	Building	Late '52	Gasoline Plane Const. Corp.
Stanolind Oil & Gas Co., Andrews County, Texas:				
Injection and gasoline plant, cu. ft. per day	20,000,000	Contracted	Late '52	Hudson Engineering Corp.
Stanolind Oil & Gas Co., Hockley County, Texas:				
Sulfur plant, tons per day	48	Contracted	Late '52	Fluor Corp., Ltd.
Tex-Harvey Gasoline Plant, Inc., Tex-Harvey field, Texas:				
Natural-gasoline plant, cu. ft. per day	60,000,000			
Texas Gas Products Corp., Upton County, Texas:				
Plant expansion		Building	Early '52	Texas Natural Gasoline Corp.
The Texas Co., Scurry County, Texas:				
Natural-gasoline plant, cu. ft. per day	20,000,000	Building	Early '52	O. L. Olsen Co.
Warren Petroleum Corp., Ringwood, Okla.:				
Natural-gasoline plant, cu. ft. per day	50,000,000	Building	Early '52	Gasoline Plant Const. Corp.
Wilmington Gasoline Co., Wilmington, Calif.:				
Plant increase, gal. per day	11,000	Planned	.....	

Completed Natural-Gas Processing-Plant Projects

Company, location, and type of project—	Capacity rating
Arkansas Fuel Oil Co., Kaskom, Tex.:	
Increase low-pressure system, cu. ft. per day	50,000,000
Arkansas Fuel Oil Co., Carthage, Tex.:	
Plant increase, cu. ft. per day	40,000,000
Arkansas Fuel Oil Co., Longview, Tex.:	
Increase propane extraction, cu. ft. per day	10,000,000
Abercrombie Co., Old Ocean field, Texas:	
Gas-dehydration plant, cu. ft. per day	145,000,000
Canadian River Gas Co., Moore County, Texas:	
Gas-treating plant, cu. ft. per day	30,000,000
Consolidated Gasoline Co., Eastland, Tex.:	
Plant increase, gal. per day	3,500
Continental Oil Co., Ventura, Calif.:	
Plant revision, cu. ft. per day	23,000,000
Del Rey Petroleum Co., Eagle Lake, Tex.:	
Plant increase, cu. ft. per day	25,000,000
El Paso Natural Gas Co., San Juan County, New Mexico:	
Gas-purification plant, cu. ft. per day	143,000,000
Gas-dehydration plant, cu. ft. per day	168,000,000
Gasoline plant, cu. ft. per day	70,000,000
Frontier Natural Gasoline Co., Loco Hills, N. M.:	
Gasoline plant, gal. per day	30,000
Hugoton Plains Gas & Oil Co., Tyrone, Okla.:	
Gasoline plant, cu. ft. per day	120,000,000
Humble Oil & Refining Co., Iberia Parish, Louisiana:	
Compressor plant, cu. ft. per day	4,500,000
Humble Oil & Refining Co., Brazoria County, Texas:	
Compressor plant, cu. ft. per day	1,800,000
Humble Oil & Refining Co., Chambers County, Texas:	
Compressor plant, cu. ft. per day	4,500,000
Humble Oil & Gas Co., Hopkins County, Texas:	
Increase compressor plant, cu. ft. per day	6,000,000
Humble Oil & Refining Co., Harris County, Texas:	
Gasoline-plant increase, cu. ft. per day	60,000,000
Humble Oil & Refining Co., Kleberg County, Texas:	
Compressor plant, cu. ft. per day	24,000,000
La Gloria Corp., Falfurias, Tex.:	
Dehydration plant, cu. ft. per day	115,000,000
Lion Oil Co., Magnolia, Ark.:	
Sulfur plant, tons per day	8.5
Lion Oil Co., Scurry County, Texas:	
Gasoline plant, cu. ft. per day	50,000,000
Mathieson Chemical Corp., Brandenburg, Ky.:	
L.P.G. and ethylene glycol plant	
Mid-Continent Petroleum Corp., Moore, Okla.:	
Gasoline plant, gal. per day	15,000
Mountain Fuel Supply Co., Rock Springs, Wyo.:	
Dehydration plant, cu. ft. per day	100,000
Phillips Petroleum Co., Moore County, Texas:	
Additional compressors, cu. ft. per day	215,000,000
Pioneer Corp., Chanute, Kans.:	
Pressure plant, water flood	
Pure Oil Co., Van Zant County, Texas:	
Rebuild plant	
Tennessee Gas Transmission Co., Gabe, Ky.:	
Gasoline plant, gal. per day	380,000
Shell Oil Co., Jumping Pound field, Canada:	
Sulfur plant	
Shell Oil Co., Elk City, Okla.:	
Cycling plant, cu. ft. per day	100,000,000
Shell Oil Co., Skellytown, Tex.:	
Booster station, cu. ft. per day	3,000,000
Stanolind Oil & Gas Co., Nueces County, Texas:	
Plant addition, cu. ft. per day	37,000,000
Sunray Oil Corp., Snyder, Tex.:	
Gasoline plant, cu. ft. per day	70,000,000
Warren Petroleum Corp., Maysville, Okla.:	
Gasoline plant, cu. ft. per day	65,000,000
West Coast Refining Co., Orange County, Calif.:	
Gasoline plant, gal. per day	50,000

(Aerial view of Carteret, N.J.)

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1952 Seen as Another Active Pipe-Line Year

Crude, products, and natural-gas lines all figure in continued expansion

by Paul Reed

PIPE-LINE construction throughout the world was extremely active during 1951. The year 1952 will be another period of intense activity.

Information covering these petroleum and natural-gas pipe-line projects in the United States and foreign countries is given in the accompanying 12 tables.

United States Projects Planned

Crude oil.—Principal crude-oil pipe-line projects under way are the 1,075-mile 16 to 20-in. Platte Pipe Line Co. line from Worland, Wyo., to Wood River, Ill., and the Sinclair Pipe Line Co. 24 and 22-in., 674-mile Drumright-Cushing, Okla.-East Chicago, Ind., system. Work will start this year on West Texas-Sour Lake, Tex., line for West Texas Gulf Pipe Line Corp. and the Rancho Pipe Line System from West Texas to the Houston area.

Products lines.—An important products line is the 565-mile 8 to 14-in. line of Shell Oil Co., projected from Wood River to Detroit. Buckeye Pipe Line Co. plans to lay 430 miles of 14-in. line from Linden, N. J., to upper New York State. Phillips Pipe Line Co. is engaged in a looping program which will provide a second parallel line from Borger, Tex., to Chicago.

Natural gas.—United Gas Pipe Line Co. is pushing a three-pronged construction program totaling more than 1,200 miles in Texas, Louisiana, and Mississippi. United's facilities will supply Texas Eastern Transmission Corp.'s 791-mile, 30-in., Kosciusko, Miss.-Connellsville, Pa., line now under construction.

Foreign Projects Planned

Crude oil.—Longest foreign crude-oil pipe-line project to be built soon is that of Trans-Mountain Oil Pipe Line Co., which will commence work on the first crude-oil pipe line between Alberta and the Pacific Coast as soon as weather permits this spring. The 700-mile 24-in. line will have an initial capacity of 75,000 bbl. per day.

First deliveries through the new 554-mile 30 and 32-in. pipe line of Iraq Petroleum Co., Ltd., from Kirkuk field in Iraq to a new tanker terminal on the eastern Mediterranean Coast at Banias, Syria, will be made in April 1952 when 100,000 bbl. daily will be moved initially.

Products lines.—Imperial Oil, Ltd., is constructing 230 miles of 10 and 12-in. extending from Sarnia to London, Ont., and from Hamilton to Toronto, Ont.; these are due for completion in July 1952. The Colombian Ministry of Petroleum has contracted for construction of 113 miles of 6-in. products line from Puerto Berrio to Acedeo near Medellin, Colombia.

Natural gas.—The 1952 program of Societa Nazionale Metandotti (S.N.A.M.) calls for laying 1,045 miles of line, ranging in size from 5 to 16-in.; this includes 277 miles of 16-in. pipe.

Venezuelan Atlantic Transmission Corp. is constructing 195 miles of 10, 12, and 16-in. from El Placer near Las Mercedes, State of Guarico, to Caracas, La Guaira, Maracay, and Valencia.

United States Projects Completed

Crude oil.—During the year, 13 projects totaling 898 miles of line were completed in the United States. Phillips Pipe Line Co. finaled three projects in Texas, Oklahoma and Kansas totaling 355 miles.

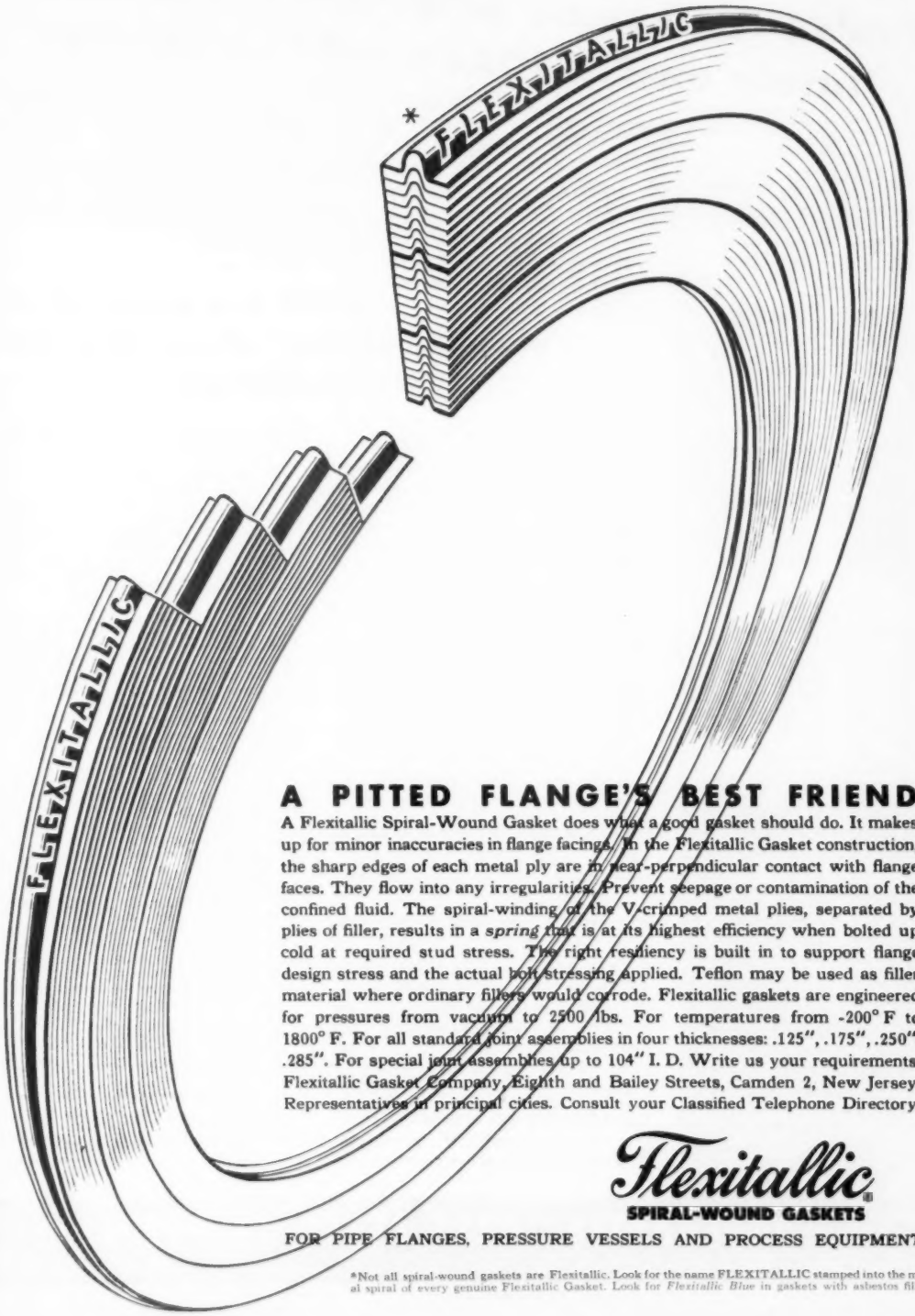
Products lines.—A total of 24 projects totaling 2,781 miles of product lines were completed during the year. Plantation Pipe Line Co. built a 707-mile, 18 and 14-in. system from Baton Rouge to Charlotte, N. C.

Natural gas.—The past year saw the completion of two major natural-gas transmission lines from the Gulf Coast to connections with gas systems in Illinois. Texas Illinois Natural Gas Pipeline Co. finaled 1,329 miles of 12, 24, 26 and 30-in. line originating in the Corpus Christi, Tex., area and terminating at Joliet, Ill. Trunkline Gas Co. completed its 1,300-mile 20 to 26-in. line extending from McAllen, Tex., on the Mexican border, to the Tuscola, Ill., terminal connection with the Panhandle Eastern Pipe Line Co. system.

Table 1—Principal Domestic Crude-Oil Projects Planned and Under Way

Company—	Miles	Inch	Status†	Contractor, location, and completion date
Continental Pipe Line Co.	105	8	Planned	Rincon to northwest of Sullivan City and on to Port Isabel, Tex., 1952.
Continental Pipe Line Co.	217	12	Planned	Wichita Falls, Tex., to Ponca City, Okla., 1952.
Interstate Oil Pipe Line Co.	33	20	Contracted	Houston Contracting Co.—Bunkie to Melville, La., 10-52.
Interstate Oil Pipe Line Co.	68	16	Contracted	Houston Contracting Co.—Raceland to Anchorage, La., 10-52.
Interstate Oil Pipe Line Co.	18	12	Contracted	Houston Contracting Co.—LaRose to Raceland, La., 10-52.
Interstate Oil Pipe Line Co.	47	16	Contracted	Houston Contracting Co.—Sunset to Anchorage, La., 7-52.
Ohio Oil Co.	117	22	Under way	R. A. Conyes Const. Co.—Sheridan, Ind., to Lima, Ohio.
Pan American Pipe Line Co.	40	14	Planned	Arden station in Irion County to Eldorado station in Schleicher County, Texas, 6-52.
Pan American Pipe Line Co.	27	26	Planned	Genoa to Texas City, Tex., 12-52.
Phillips Pipe Line Co.	27	8	Planned	Looping from Yale, Okla., to Thrall, Kans.
Platte Pipe Line Co.*	1,075	16-20	Under way	Various—Worland, Wyo., to Wood River Ref. area in Illinois.
Platte Pipe Line Co.	573	16-20	Under way	(Sections 1-2-3-4) R. H. Fulton & Co.—Winchester, Wyo., to Brule, Neb.

*Data on entire project for which certain segments are mentioned separately in these tables. †The status of each project in the various stages from earliest preparation to actual construction is indicated by one of the following terms: (1) Considered; (2) Proposed; (3) Deferred; (4) Planned; (5) Contracted; or (6) Under way.



A PITTED FLANGE'S BEST FRIEND

A Flexitallic Spiral-Wound Gasket does what a good gasket should do. It makes up for minor inaccuracies in flange facings. In the Flexitallic Gasket construction, the sharp edges of each metal ply are in near-perpendicular contact with flange faces. They flow into any irregularities. Prevent seepage or contamination of the confined fluid. The spiral-winding of the V-crimped metal plies, separated by plies of filler, results in a *spring* that is at its highest efficiency when bolted up cold at required stud stress. The right resiliency is built in to support flange design stress and the actual bolt-stressing applied. Teflon may be used as filler material where ordinary fillers would corrode. Flexitallic gaskets are engineered for pressures from vacuum to 2500 lbs. For temperatures from -200° F to 1800° F. For all standard joint assemblies in four thicknesses: .125", .175", .250", .285". For special joint assemblies up to 104" I. D. Write us your requirements. Flexitallic Gasket Company, Eighth and Bailey Streets, Camden 2, New Jersey. Representatives in principal cities. Consult your Classified Telephone Directory.

Flexitallic®
SPIRAL-WOUND GASKETS

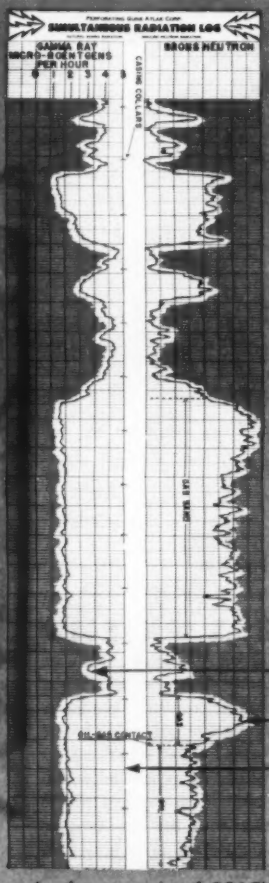
FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

*Not all spiral-wound gaskets are Flexitallic. Look for the name FLEXITALLIC stamped into the metal spiral of every genuine Flexitallic Gasket. Look for *Flexitallic Blue* in gaskets with asbestos filler.

You've read some wild "mumbo jumbo" lately on RADIOACTIVITY LOGGING—

NOW, Let PGAC TAKE YOU BEHIND THE SCENES

HERE are some of the "unmentionables" about NEUTRON Well Logging!



Another example of PGAC's clear definition and interpretive qualities; this interpretation was subsequently verified. This log *(below 10,000 ft.)* is an exact reproduction of the original recording. Notice the perfect absence of *"temperature drift."*

The outstanding advantages of SIMULTANEOUS RADIATION LOGGING, a method *exclusive* with Perforating Guns Atlas Corporation, have been *proved* by many leading oil companies and countless independents. Competitive tests on the same holes have *repeatedly* proved:

1—PGAC's superiority in log *accuracy*
2—PGAC's superiority in log *stability* —"repeatability"
3—PGAC's superiority in *reliability of log interpretation*
4—PGAC's *savings of 60% in rig down-time* for logging

NOW . . . let's see Why this is true

Perforating Guns Atlas Corporation developed the world's first—*and uses the world's only*—SIMULTANEOUS RADIATION LOG . . . which simultaeously records:

A—a Gamma Ray curve—*with quantitative calibration* indicating microroentgens per hour
B—a "pure" *Neutron/Neutron* curve—absolutely unaffected in any way by Gamma Rays of any kind
C—a positive depth indication—by a supersensitive and accufate locator for pipe collars or flush joints

And all three of these PGAC records are made from a single instrument *on a single trip in the hole.* They are thereby *absolutely interlocked* and *automatically correlated* . . . whereas every competitive log attempting to determine similar data, must be separately recorded on at least two trips in the hole—and then must be correlated for depth relationship by superimposing and adjusting the separate recordings, with the ever-present possibility of human error.

PGAC, and only PGAC, completely eliminates such possibility of human error with its *exclusive* method of SIMULTANEOUS RADIATION LOGGING. And because all three records are simultaneously produced *on one chart,* no correlation is necessary; so the *relationship* of these phenomena by the PGAC method is automatic; positive, and absolutely accurate.

Here are *FACTS* you can understand

As you know, Neutron well logging is accomplished by lowering into the hole an instrument containing a Fast-Neutron source for bombarding the formation being logged, and a detector for recording the results of that bombardment. Essentially, the Fast-Neutron sources are all similar, but the detectors used are of two entirely different types.

Only Perforating Guns Atlas Corporation uses the "pure" *Neutron/Neutron* method of detection for the Neutron curve (B, above). For this purpose, PGAC uses a *Slow-Neutron* counter to detect the Slow-Neutron radiation resulting after the Fast-Neutron has bombarded and traversed the formation being logged. And because this counter will not respond to *anything* but Slow- Neutrons, the PGAC Neutron Log is a true curve *entirely unaffected* by certain detrimental Gamma Rays. These detrimental Gamma Rays are present and are recorded in all competitive methods—due to the fact that all competitive methods are dependent upon the Neutron/Gamma method of detection.

Remember, only PGAC can use the *Neutron/Neutron* method, upon which the ever-present Gamma Rays have no influence.

Neutron/Neutron VS. Neutron/Gamma Logging

All radioactivity logging *except that done by PGAC,* is dependent upon the

PERFORATING GUNS ATLAS CORPORATION

General Offices and Main Plant: 3915 Tharp Street, Houston 3, Texas, Telephone: PReston 4351

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Canadian Affiliate: PERFORATING GUNS OF CANADA, LTD., Edmonton, Alberta, Canada

EVERY OIL MAN SHOULD READ THIS EXPOSE'

an understanding of oilfield atomic energy in 5 minutes reading time

You can't fool all of the people all the time . . . not even with wild claims. So, let's call a spade *a spade!* Let's see why these wild claims are never supported by some plain, honest-to-goodness, understandable *facts* on the science of atomic energy as employed in well logging. Then, *you* be the judge!

use of a small ionization chamber to obtain the so-called Neutron Log (but which, actually, is a Neutron/*Gamma* Log) . . . whereas PGAC enjoys patent protection in the *exclusive use* of the afore-mentioned Slow-Neutron counter to obtain a "pure" Neutron/Neutron log.

The ionization chambers used in all competitive Neutron logging, are responsive only to Gamma Rays of various types—not to Neutrons of any type. Neutron/Gamma Logs are intended to reflect the detection of *secondary* Gamma Rays-of-capture ONLY (which result from Neutron bombardment of the formation being logged) . . . and it should be remembered that this *secondary* Gamma radiation is the only phenomenon which can be utilized by competitive methods to obtain their Neutron/Gamma logs. It is a scientific fact, however, that the logging of this one phenomenon *alone* is utterly impossible, because two other phenomena are *always* present—and these other two are decidely detrimental to obtaining an accurate Neutron curve.

The first of these two detrimental phenomena is the *natural* Gamma radiation from the formation being logged. Under normal logging conditions, this *natural* Gamma radiation may be of low magnitude and not present too much of a problem. However, many instances are known where strong *natural* radiation from the formation being logged could overshadow the vital *secondary* Gamma radiation and cause an erroneous log.

The second detrimental phenomenon is the strong, scattered, *primary* Gamma radiation which results from the Neutron source itself, simply because there is always a very strong radiation of Gamma Rays present in the bombardment source. To prevent this strong *primary* Gamma radiation from completely blocking out the *secondary* Gamma radiation — from which the log must be obtained — all competitive Neutron logging instruments are forced to use a shielding between the Neutron bombardment source and the ionization chamber obtaining the phenomenon. And right here another crux of the problem arises!

Due to the necessarily limited diameter of the logging instrument lowered into the hole, it is impossible to effect *complete* shielding between the Neutron source and the ionization chamber. Consequently, Neutron/Gamma curves recorded under all competitive methods are affected by this detrimental *primary* Gamma radiation to a greater or lesser extent, *depending upon variations in the size of the bore-hole,* as well as upon other conditions encountered therein. Therefore, and naturally enough, the Neutron/Gamma curve may lack clear definition, and the interpretation of the faulty curve may reflect conditions inconsistent with the true formation facts.

Reasons for PGAC's *Pin Point Accuracy*

Since the exclusive PGAC Slow-Neutron counter is not responsive to Gamma Rays *of any type,* no shielding against them is necessary. And since the PGAC counter is not responsive to Fast-Neutrons either, no shielding is even required against the Fast-Neutrons that may go from the bombardment source directly to the counter. With only those Neutrons which have been slowed down by traversing the formation being detected by the PGAC counter, *the reason* for the clear definition and superiority of our Neutron/Neutron curve becomes obvious.

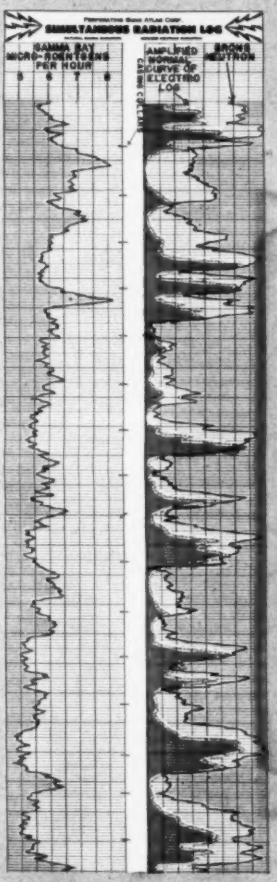
Because of these many exclusive PGAC features, no other radioactivity log can possibly equal PGAC's SIMULTANEOUS RADIATION LOG. And remember too, only the Perforating Guns Atlas Corporation offers this proved superiority in *Accuracy, Stability, Reliability, and Economy.*

So, play it safe . . . always call in PGAC to run a Radiation Log on your well — you'll get a better log, better service — and you'll save 60% of your rig down-time!

PGAC Automatic Correlation–like marriage–Sure Prevents Human Errors!

AUTHENTICATION!

Substantiation of these *behind-the-scenes* facts may be found in the new technical volume, "Principles of Petroleum Geology," by Wm. L. Russell, Associate Professor of Geology at Texas Agricultural & Mechanical College. Any additional data you desire may be obtained without obligation by writing PGAC for answers to your specific questions.


SIMULTANEOUS RADIATION LOG
GAMMA RAY MICRO-ROENTGENS PER HOUR
5 6 7 8
AMPLIFIED NORMAL CURVE OF ELECTRIC LOG
BRONS NEUTRON

Another example of PGAC's outstanding correlation (of a Neutron/Neutron curve with the electrical log) in an area where, previous to PGAC's Simultaneous Radiation Logging, correlation was very difficult — if not impossible.

PERFORATING GUNS ATLAS CORPORATION

General Offices and Main Plant: 3915 Tharp Street, Houston 3, Texas, Telephone: PReston 4351

OIL FIELD SERVICES BY PGAC

Simultaneous Radiation Logging, Gamma Ray Logging, Brons Neutron/Neutron Logging, Electrical Logging, Jet Shot Perforating, Bullet Perforating, All Wire Line Services, 24-Hour Service From All Stations

Canadian Affiliate: PERFORATING GUNS OF CANADA, LTD., Edmonton, Alberta, Canada

Table 1—Principal Domestic Crude-Oil Projects Planned and Under Way (Continued)

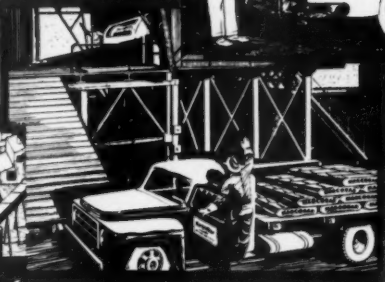
Company—	Miles	Inch	Status†	Contractor, location, and completion date
Platte Pipe Line Co.	142	20	Under way	(Section 5) Bishop and Lock—Near Marysville, Kans., to Holdredge, Neb.
Platte Pipe Line Co.	100	20	Under way	(Section 6) Rumsey Bros.—Northern edge of Kansas.
Progress Pacific Pipe Line Co.	900	24	Proposed	Permian basin, West Texas, to California.
Rancho Pipe Line System	464	24	Planned	McCamey, Tex., to Houston, 1952.
Roosevelt Oil & Refining Corp.	22	4-6	Planned	St. Helens to Norwich, Mich.
Service Pipe Line Co.	63	10	Planned	Cogdell to Old Glory, Tex.
Shell Pipe Line Corp. (with Texas Pipe Line and Toronto Pipe Line Co.)	53	12	Planned	Sterling, Colo., to Gurley, Neb., 9-1-52.
Shell Pipe Line Corp.	42	8	Planned	Hallettsville to LaGrange, Tex., 7-1-52.
Sinclair Pipe Line Co.*	674	22-24	Planned	Drumright-Cushing, Okla., area to E. Chicago, Ind.
Sinclair Pipe Line Co.	150	24	Contracted	(Section 1) O. R. Burden Const. Co.—Drumright-Cushing, Okla., area to Humboldt, Kans.
Skelly Oil Co.	38	8	Under way	Rumsey Bros.—Lyons to Burrton, Kans.
Texas Pipe Line Co.	319	10-12-22	Contracted	Houston Contracting Co.—Louisiana Gulf Coast to Port Arthur, Tex., summer 1952.
Texas Pipe Line Co.	220	22	Contracted	Houston Contracting Co.—Houma, La., to Port Arthur, Tex
Texas Pipe Line Co.	31	12	Contracted	Houston Contracting Co.—Houma to Cocodrie, La.
Union Oil Co. of California	40	8-10	Planned	San Joaquin Valley and Los Angeles basin, California.
West Texas Gulf Pipe Line Co.	467	24-26	Contracted	Anderson Bros.—Colorado City to Wortham; Wortham to Sour Lake, Tex. 10-52.
West Texas Gulf Pipe Line Co.	114	20	Contracted	Wortham to Longview, Tex. 10-52.

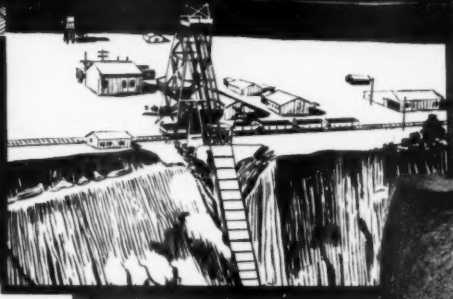
Table 2—Principal Domestic Products Projects Planned and Under Way

Bell Oil & Gas Co.	150	6-8	Planned	Ardmore to Drumright, Okla. (114 miles, 8-in., and 32 miles, 6-in.).
Buckeye Pipe Line Co.	430	14	Planned	Linden, N. J., to Allentown, Pa., on to New York State, 1953.
Ohio Oil Co.	24	8	Planned	East St. Louis to Wood River, Ill.
Phillips Oil Co.	28	12	Planned	Sweeny to Freeport, Tex., 3-52.
Phillips Pipe Line Co.	74	8	Under way	Somerville Const. Co.—Decatur, Ill., to E. Chicago, Ind.
Phillips Pipe Line Co.	68	12	Under way	Brown Lite Co.—Osawatomie, Kans., westward towards Wichita.
Progress Pacific Pipe Line Co.	900	10	Proposed	California to West Texas.
Salt Lake Pipe Line Co.			Proposed	Pasco, Wash., to Puget Sound.
Shell Oil Co.*	565	14-8	Planned	Wood River via East Chicago to Detroit, summer 1952.
Shell Oil Co.	35	14	Planned	Beecher to Argo, Ill.
Sinclair Pipe Line Co.		8	Proposed	Sinclair, Wyo., to Salt Lake City, Utah.
Sinclair Pipe Line Co.		10	Proposed	Houston to Baton Rouge, La.
Sinclair Pipe Line Co.		16	Proposed	Kalamazoo to Detroit, Mich.
Sinclair Pipe Line Co.		20	Proposed	Marcus Hook to Bayonne, N. J.
Sinclair Pipe Line Co.			Proposed	East Chicago to South Bend, Ind.
Socony-Vacuum Oil Co.	175	6-8	Under way	Ray L. Smith & Son, Inc.—Augusta, Kans., to Kansas City, Mo., 1-52.
Standard Oil Co. (Indiana)	122	8	Under way	Bills and Troth Const. Co.—Neodesha, Kans., to Belton, Mo.
United States Pipe Line Co.	1,000		Proposed	Gulf Coast via Memphis, Nashville, Tenn., Lexington, and Paducah, Ky., to Cincinnati, Ohio.

Table 3—Principal Domestic Natural-Gas Projects Planned and Under Way

Algonquin Gas Transmission Co.	253	26-24	Planned	Lambertville, N. J., to Boston Area.
Algonquin Gas Transmission Co.	279		Planned	New Jersey, Connecticut, Rhode Island, and Massachusetts.
Allied Gas Co.	24	6	Proposed	McLean to Champaign County, Ill.
Associated Natural Gas Co.	88		Planned	Missouri.
Carolina Natural Gas Corp.	185	2-12	Proposed	Lateral lines off Transcontinental in North and South Carolina.
Coast Counties Gas & Electric Co.	40	3-4-8	Considered	Coast and Valley region, California.
Colorado Interstate Gas Co.	250	20	Under way	R. H. Fulton & Co.—Kit Carson, Colo., to Amarillo, Tex.
Commonwealth Natural Gas Corp.	537	30	Proposed	West Bend, Ky., to Norfolk, Va.
Cumberland & Allegheny Gas Co.	46	10	Planned	Mountain Lake Park, Md., to Preston County, West Virginia.
Dow Chemical Co.	70	Various	Under way	Mahoney Contracting Co.—Area of Midland, Saginaw and Bay City, Mich.
East Tennessee Natural Gas Co.	172	22	Planned	Greenbrier to Oak Ridge, Tenn.
East Tennessee Natural Gas Co.	100	16	Planned	Knoxville to Kingsport, Tenn.
Georgia Gas Co.	32	4	Proposed	Bogart to Gainesville, Ga.
Glacier Gas Co.	285	20	Proposed	Pincher Creek field, Alta., Canada, to area in northwestern Montana, northern Idaho, and eastern Washington.
Glacier Gas Co.	120	20	Proposed	Spokane to Hanford, Wash.
Glacier Gas Co.	91	8	Proposed	Spokane to Lewiston, Idaho.
Glacier Gas Co.	130	12	Proposed	Spokane to International Boundary at Trail, B. C.
Grand Valley Pipe Line Co.	105	8-10	Contracted	Piceance Creek field to Rifle on to Grand Junction, Colo.
Gulf Michigan Transmission Corp.	680	30	Deferred	Perryville, La., across Arkansas, Missouri, and Illinois to terminus near St. John, Ind.
Interstate Power Co.	26	8	Proposed	From Natural Gas Pipe Line Co. of America line near Hooppole, Ill., to Clinton, Iowa.
Iowa-Illinois Gas & Electric Co.	41	10	Planned	Washington County to Cedar Rapids, Iowa.





The Story Behind the Sack of Mud

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DRILLING MUD SERVICE
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MAGNET COVE BARIUM CORPORATION

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Table 3—Principal Domestic Natural-Gas Projects Planned and Under Way (Continued)

Company—	Miles	Inch	Status†	Contractor, location, and completion date
Kansas-Nebraska Natural Gas Co., Inc.	65	2-8	Planned	Big Springs field to Ogallala, Neb., and to Ovid, Colo.
Kansas-Nebraska Natural Gas Co., Inc.	40	6	Under way	Jayhawk Const. Co.—Albion to Norfolk, Neb.
Kansas-Nebraska Natural Gas Co., Inc.	30	6	Under way	Jayhawk Const. Co.—Albion to Neligh, Neb.
Kansas-Nebraska Natural Gas Co., Inc.	39	4-6	Contracted	Jayhawk Const. Co.—Neligh to O'Neill, Neb.
Kansas-Nebraska Natural Gas Co., Inc.	54	4-6	Planned	Neligh to Hartington, Neb., 1952.
Lake Shore Pipe Line Co.	45	10	Planned	Northwesterly from Tenn. G. T. system near Meadville, Pa., to Ashtabula, Ohio.
Michigan Gas Storage Co.	93	16-22-24	Under way	Mahoney Contracting Co.—Lainsburg to near Pontiac and Mt. Clemens, Mich., 6-52.
Michigan Gas Storage Co.	30	26	Planned	Looping between Lainsburg and Mt. Pleasant Junction, Mich.
Mid-South Gas Co.	240		Proposed	Greene, Poinsett, Crittenden, St. Francis Lee, Phillips, Monroe, Woodruff and Cross counties, Arkansas.
Mississippi River Fuel Corp.	40	18	Planned	Dubach to Perryville, La.
Mississippi River Fuel Corp.	96	18-16	Under way	Houston Contracting Co.—Ruston, La., to Marshall, Tex.
Missouri Central Gas Co.	25	6	Contracted	L. R. Young Const. Co.—Moberly to Macon, Mo.
New River Gas Co.	50		Planned	Summers to Monroe counties, W. Va., to Narrows and Dublin, W. Va.
New York State Natural Gas Corp.	66	20	Proposed	Looping in Westmoreland, Armstrong, Potter, and Tioga counties, Pennsylvania.
Niagara Mohawk Power Corp.	55	10	Under way	Williams-Austin—Fulton to Watertown, N. Y.
Northeastern Gas Transmission Co.	375	20-24	Planned	New Hampshire, Massachusetts, and Connecticut.
Northern Indiana Fuel & Light Co.	33	8	Proposed	Edgerton to Auburn, Ind.
Northern Natural Gas Co.*	580		Proposed	Loops in Kans., Tex., Okla., and Neb.
Northern Natural Gas Co.	370	4-26	Planned	Gathering lines, Hugoton field.
Northern Natural Gas Co.	217	26	Under way	G. G. Griffis Const. Co.—Five loops, Palmra, Neb., to Skellyville, Tex.
Northern Natural Gas Co.	181	4 to 12	Contracted	Reese Bros. Const.—Gathering lines in Hugoton field.
Northwest Natural Gas Co.			Considered	Washington, Oregon, and Idaho.
Ohio Fuel Gas Co.	61		Planned	Northern and southwestern Ohio.
Ohio Fuel Gas Co.	22	16	Planned	Dayton, Troy, Piqua, and Sidney.
Ohio Fuel Gas Co.	25	20	Contracted	Sheehan Pipe Line Const. Co.—Xenia, Ohio.
Ohio Fuel Gas Co.	74	3 to 20	Planned	Hocking, Knox, and Ashland counties, Ohio.
Ohio Fuel Gas Co.	47	20	Planned	Benton Township, Hocking Co., to Columbus, Ohio.
Oklahoma Natural Gas Co	36	12	Under way	Trojan Const. Co., Inc.—Ringwood to Enid, Okla., 3-15-52.
Pacific Gas & Electric Co.*	141	34	Proposed	Loops along Topock-Milpitas line.
Pacific Gas & Electric Co.	44	8	Under way	W. A. Tyler—Salinas to King City, Calif.
Pacific Northwest Pipe Line Co.	400	22	Proposed	Gathering lines on Texas Gulf Coast to Pacific Northwest Pipeline.
Pacific Northwest Pipe Line Co.	2,175	26	Proposed	Wharton County, Tex., via Okla., Kans., Fort Collins, Colo., to Portland, Ore., Tacoma and Seattle, Wash.
Pennsylvania Gas Co.	52	12	Under way	Harford Bros.—Between Warren and Erie, Pa.
Peoples Natural Gas Co.	25		Proposed	Cambria and Blair counties, Pennsylvania.
Phillips Petroleum Co.	118	3-22	Under way	Vaughn & Taylor Const. Co., Inc.—Sherman and Hansford counties, Tex., gas-gathering system.
Piedmont Natural Gas Co.	28	6	Proposed	Gragg Const. Co.—North Carolina laterals from Transco system.
Prince George's Gas Corp.	20	22	Planned	Between Chillum and Rockville, Md.
Public Service Co. of North Carolina	33	10	Planned	Burlington to Chapel Hill, N. C., 3-1-52.
Public Service Co. of North Carolina	16	8	Planned	Chapel Hill to Raleigh, N. C., 7-1-52.
Public Service Co. of North Carolina	29	4	Planned	Statesville to Kannapolis, N. C., 7-1-52.
Public Service Co. of North Carolina	83	8	Planned	Kings Mountain to Asheville, N. C., 3-1-53.
Rockland Light & Power Co.	22	8	Proposed	Orangetown to Tomkins Cove, N. Y.
Southern California Gas Co. and Southern Counties Gas Co. of California	87	30	Proposed	Whitewater to Desert Center, Calif.
Southern California Gas Co. and Southern Counties Gas Co. of California	45	30	Proposed	Looping on line from Arizona border to Los Angeles.
Southern Natural Gas Co.	169		Proposed	Ouachita Parish, La., to Augusta, Ga.
Southern Natural Gas Co.	21	24	Planned	Perryville station, La., to Boeuf River.
Southern Union Gas Co.	27	10	Planned	Lea and Eddy counties, New Mexico, 1952.
Southwest Gas Corp., Ltd.	26		Proposed	From P.G.E. line to Victorville, Calif.
Sunray Oil Corp.	133	3-30	Under way	Vaughn & Taylor Const.—Snyder Gasoline Plant, Scurry County, Texas.
Tennessee Gas Transmission Co.	420	30	Planned	Texas, La., Ark., Miss., Tenn., and Ky. loops.
Tennessee Gas Transmission Co.	101	26	Planned	Kentucky and Ohio loops.
Texas Eastern Transmission Corp.*	791	30	Under way	Kosciusko, Miss., to Connellsville, Pa.
Texas Eastern Transmission Corp.	163	30	Under way	(Section 1 and 2)—Williams Bros. Davis Co.—Kosciusko, Miss., to Florence, Ala.
Texas Eastern Transmission Corp.	76	30	Under way	(Section 3) Eastern Pipe Line Contractors—Florence, Ala., to Columbia, Tenn.
Texas Eastern Transmission Corp.	73	30	Under way	(Section 4) H. B. Zachry Co.—Columbia, Tenn., to Cumberland River.
Texas Eastern Transmission Corp.	79	30	Under way	(Section 5) Oman Const. Co.—Cumberland River to Columbia, Ky.
Texas Eastern Transmission Corp.	82	30	Under way	(Section 6) N. A. Saigh Co.—Columbia, Ky., to Boonesboro, Ky.
Texas Eastern Transmission Corp.	100	30	Under way	(Section 7) Mahoney Const.—Kentucky River to Ohio River, northeastern Kentucky.
Texas Eastern Transmission Corp.	35	30	Under way	Mahoney Contracting Co.—Delmont to Uniontown, Pa.
Texas Eastern Transmission Corp.	50	30	Under way	Trojan Const. Co., Inc.—Ohio River to Vanceburg, Ky.

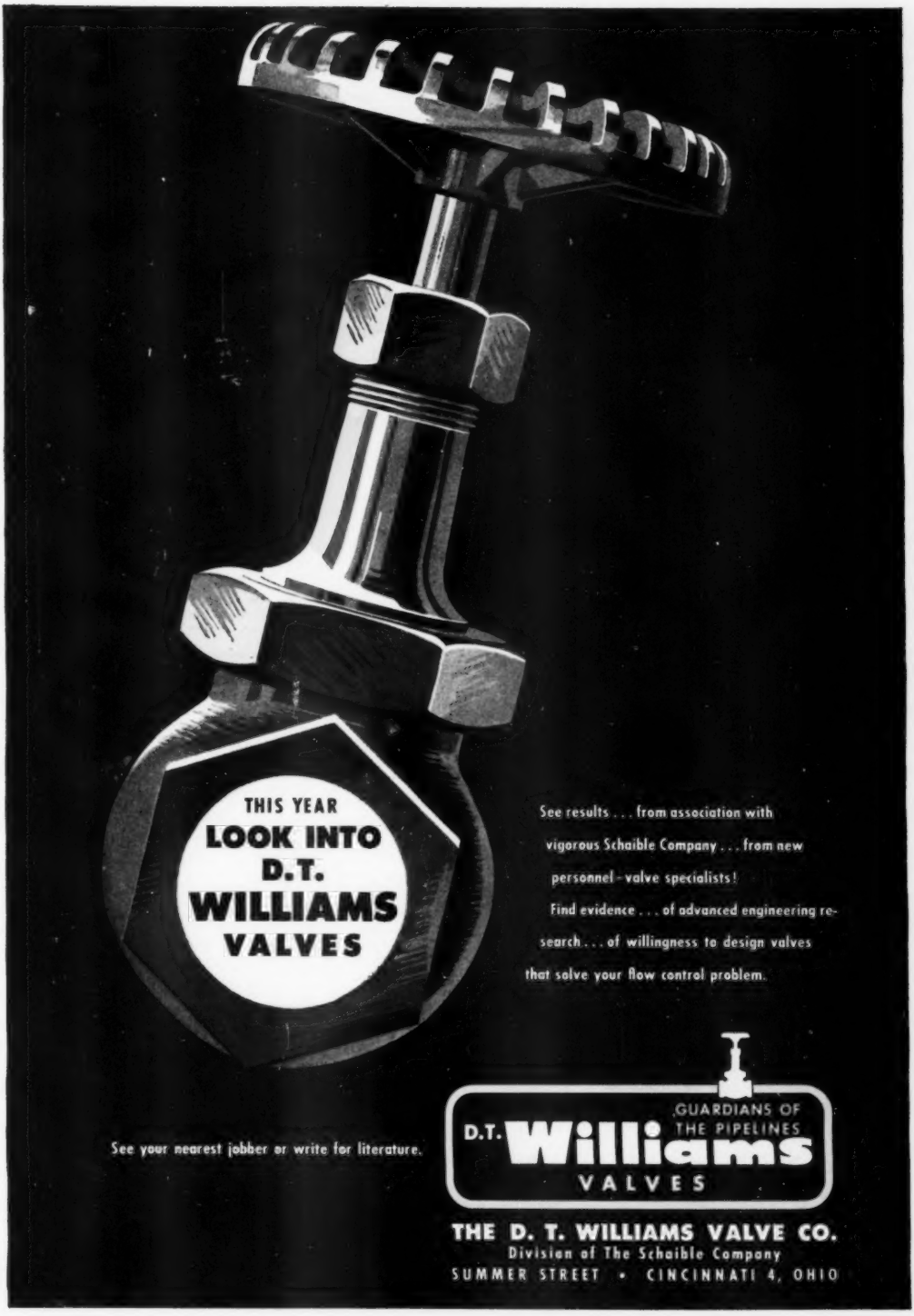
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Table 3—Principal Domestic Natural-Gas Projects Planned and Under Way (Continued)

Company—	Miles	Inch	Status†	Contractor, location, and completion date
Texas Eastern Gas Transmission Co.	77	30	Under way	(Section 8) Anderson Bros.—Portsmouth to Amesville, Ohio.
Texas Eastern Gas Transmission Co.	74	30	Under way	(Section 9) Anderson Bros.—Amesville to Ohio-West Virginia river crossing.
Texas Eastern Gas Transmission Co.	66	30	Under way	(Section 10) Anderson Bros.—Ohio River to Connellsville, Pa.
Texas Gas Transmission Corp.	33	12	Planned	Slaughters, Ky., to Evansville, Ind.
Texas Gas Transmission Corp.	425	26	Planned	Looping from Bastrop, La., to Hardinsburg, Ky.
Texas Gas Transmission Corp.	189	26	Planned	Acadia Parish to connection with existing facilities in Morehouse Parish.
Texas Gas Transmission Corp.	181	26	Under way	Houston Contracting Co.—Bastrop to Eunice, La.
Texas-Ohio Gas Co.	1,350	30	Proposed	Hidalgo County, Tex., through Arkansas, Mississippi, Tennessee, and Kentucky on to Spencer, W. Va., 6-30-53.
United Fuel Gas Co.	32	20	Under way	H. L. Gentry Const. Co.—Lanham to Broad Run, W. Va.
United Gas Pipe Line Co.	50	16	Planned	Baldwin County, Ala., southeasterly to Escambia County, Fla.
United Gas Pipe Line Co.	93	20-24-26	Contracted	River Const. Corp.—Houston to Dupont's Sabine River Works, Orange, Tex.
United Gas Pipe Line Co.	315	24-30	Contracted	Oklahoma Contracting Co.—Agua Dulce to point near Goodrich, Tex.
United Gas Pipe Line Co.	53	24	Planned	Texas.
United Gas Pipe Line Co.*	510	20-30	Under way	Gulf Southern Contractors (joint venture of Texas Louisiana Contractors; Oklahoma Contracting; J. Ray McDermott and Morrison-Knudson)—Agua Dulce, Tex., to Monroe, La.
United Gas Pipe Line Co.*	233	20-30	Under way	Gulf Southern Contractors—From Pure Oil Co.'s Offshore Platform Block 32 Eugene Is. area to Jackson, Miss., comp. sta.
United Gas Pipe Line Co.	42	24	Under way	Gulf Southern Contractors—From Verna comp. sta., Miss., to Baxterville, Miss., dehydration plant.
United Gas Pipe Line Co.	52	20-24-26	Under way	Gulf Southern Contractors—Lirette to Napoleonville, La., to tie into Eugene Is.-Jackson, Miss. 30-in. line.
United Gas Pipe Line Co	60	12-16-20	Under way	Gulf Southern Contractors—LaFayette comp. sta., and Weeks Is. field to Franklin, La., to connect with 30-in.
United Gas Pipe Line Co.	59	30	Under way	Gulf Southern Contractors—Jackson comp. sta., Miss., to Texas Eastern Trans. Corp. proposed 30-in. line near Kosciusko, Miss.
United Gas Pipe Line Co	124		Under way	Gulf Southern Contractors—Sterlington comp. sta., near Monroe, La., to Jackson comp. sta., Miss.
United Gas Pipe Line Co.	23	8-12-16	Planned	South Louisiana facilities.
Utah Natural Gas Co	360	22	Proposed	San Juan basin area to Salt Lake City.
Virginia Natural Gas Co.	153		Proposed	Buckingham to Richmond and Portsmouth, Va.
West Texas Gas Co.	27	10	Planned	Lubbock to Abernathy, Tex.
West Texas Gas Co.	35		Proposed	Potter and Randall counties, Texas.

Table 4—Principal Foreign Crude-Oil Projects Planned and Under Way

Cia. de Petroleo Ganso Azul, Ltd.	48	4	Planned	Ganso Azul field to Pucallpa on Upper Ucayali River, Peru.
Condor	85	12	Under way	Societa Romana cordotte d'Aqua—Genoa to Rho, near Milan, Italy.
Creole Petroleum Corp	143	26	Planned	Ule (State of Zulia) to Amuary (State of Falcon), 3-53.
Creole Petroleum Corp.	25	34	Planned	Lagunillas to La Salina (State of Zulia), 3-53.
Direccion General de Yacimientos Petroliferos Fiscales	409		Planned	Plaza Huincul-Bahia Blanca, Argentina.
Iraq Government	135	12	Planned	M. W. Kellogg Co.—From Iraq Petroleum Co. at Baiji to Baghdad, Iraq.
Iraq Petroleum Co., Ltd.	556	30-32	Under way	Bechtel-Kirkuk—Kirkuk to Banias, 1952.
Kuwait Oil Co., Ltd.	10	20	Under way	3rd Transit line Burgan-Ahmadi, 2-52.
Kuwait Oil Co., Ltd.	6	30	Planned	6th Gravity Loading line, Ahmadi-Mina al Ahmadi, 6-52.
Kuwait Oil Co., Ltd.	5	16-20	Planned	Burgan field—Oil collecting line.
Mene Grande Oil Co.	15	16	Contracted	Chicago Bridge & Iron Co.—Oficina to Anaco.
Middle East Pipelines, Ltd.	800	34-36	Deferred	Iran-Levantine Port.
Petroleos Mexicanos	145	13	Considered	Reynosa to Monterrey, Mexico.
Petroleos Mexicanos	100		Planned	Isthmus of Tehuantepec, Jose Colomo to El Plan field, Minatitlan.
Shell Caribbean Petroleum Co.	165	30	Under way	Williams Bros.—Palmarejo to Mara to Paraguana Peninsula, 4-52.
Texas Petroleum Co.	60	4-6	Under way	Pto. Nino to La Dorada, Colombia.
Trans-Mountain Oil Pipe Line Co. (Canadian Bechtel, Ltd., agent)	700	24	Contracted	Comstock Midwestern, Ltd., and Mannix, Ltd.—Edmonton, Alta., via Yellowhead Pass to Vancouver, B. C., start 1952.

Table 5—Principal Foreign Products Projects Planned and Under Way

Colombian Ministry of Petroleum	90	6	Planned	Puerto Berrio to La Dorada, Colombia.
Colombian Ministry of Petroleum	113	6	Contracted	Carolina Const. Co.—Puerto Berrio to Acedeo near Medellin, Colombia.
Colombian Ministry of Petroleum	75	4	Planned	Buena Ventura-Cali, Colombia.
Empresa de Ferrocarriles Ecuatorianos	50	5	Planned	J. A. Jones—Guayaquil to Palmira, Ecuador, S. A.

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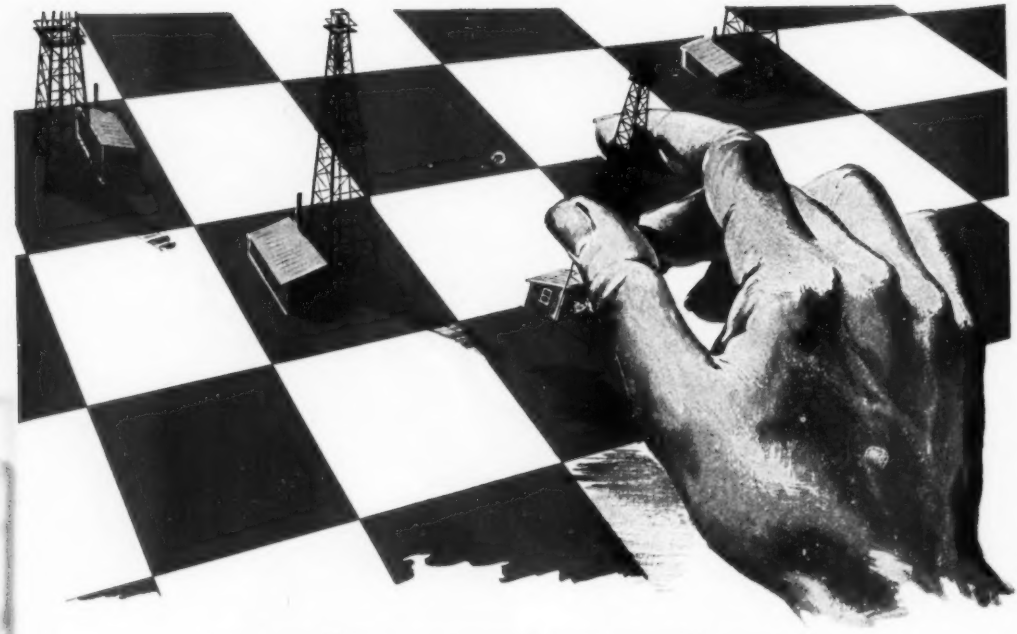

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Table 5—Principal Foreign Products Projects Planned and Under Way (Continued)

Company—	Miles	Inch	Status†	Contractor, location, and completion date
Estrada de Ferro Santos a Jundiai	32	18	Under way	Techint—Santos to Sao Paulo, Brazil.
Governments of Southern Rhodesia and Portuguese East Africa	200		Considered	Beira, Portuguese Mozambique to Umtali, Southern Rhodesia.
Imperial Oil, Ltd.	230	10-12	Under way	Comstock Midwestern, Ltd.—Sarnia to London—Hamilton to Toronto, Ont., 7-52.
Petrocongo	225		Considered	Ango-Ango to Leopoldville, Belgian Congo.
Petroleos Mexicanos	155	10	Under way	Minatitlan to Salina Cruz, Mexico.
Societe des Transports Petroliers par Pipe Line	140	10	Under way	Entrepose—Le Havre to Paris, France, 1952.
State of Cundinamarca, Colombia	120	6	Under way	Williams Bros.—Puerto Salgar to Bogota, Colombia, S. A.
Trans-Northern Pipe Line Co.	400		Planned	Hamilton to Toronto, Ont., to Montreal, Que., Canada.

Table 6—Principal Foreign Natural-Gas Projects Planned and Under Way

Azienda Generale Italiana Petroli	110	12-14-16	Planned	Genoa to Cortemaggiore, Italy.
Azienda Generale Italiana Petroli	110		Planned	Cortemaggiore to Bologna, Italy.
Azienda Generale Italiana Petroli	145	14-16	Under way	Cortemaggiore to Torino, Italy.
Direccion General del Gas del Estado	310	8	Under way	Plaza Huincul to Neuquen, Argentina, to vicinity of General Conesa, Argentina.
Northwest Natural Gas Co.	950	24	Planned	Alberta fields to Vancouver, B. C., Seattle, Wash., and Portland, Ore.
Petroleos Mexicanos	205	16	Under way	Monterrey to Torreon, Mexico.
Petroleos Mexicanos	260	20	Considered	Monterrey-Tampico-Poza Rica, Mexico.
Petroleos Mexicanos, Mexican Gas Co., and Industrial Gas Co.	600		Planned	Reynosa, Tamaulipas, Tampico, Poza Rica, Mexico.
Trans-Canada Pipe Lines, Ltd. (Canadian Delhi Oil Co.)	2,132		Proposed	Alberta gas fields to Toronto, Ont., and Montreal, Que.
Venezuelan Atlantic Transmission Corp.	195	10-12-16	Under way	Williams Bros. de Veneuzela, S. A.—El Placer near Las Mercedes, State of Guarico, to Caracas, La Guarico to Caracas, La Guaira, Maracay, and Valencia.
Westcoast Transmission Co., Ltd. (Ford, Bacon & Davis Engineering)	1,110	24	Planned	Dawson Creek, B. C., through Pine Pass and Fraser River Valley to Kamloops, Princeton and Vancouver to Portland.
Westcoast Transmission Co., Ltd.	280	20	Proposed	Pincher Creek to Montana on to Spokane, Wash.
Western Pipe Lines	1,033	24	Proposed	From southern Alberta, eastward across the Canadian prairies, serving principal towns and cities along the route, to a point near the International Boundary.

Table 7—Principal Domestic Crude-Oil Projects Completed

Company—	Miles	Inch	Contractor, location, and completion date
Atlantic Pipe Line Co.	30	6	Brillhart station area, Tex.
General Petroleum Corp.	40	4	Esteros Bay to San Ardo, Calif., 6-1-51.
Gulf Refining Co.	87	14	Lumberton, Miss., to Mobile, Ala., 1-1-52.
Interstate Oil Pipe Line Co.	35	12	New Iberia to Sunset, La.
Interstate Oil Pipe Line Co.	20	6-8	New Iberia to Weeks Island and Avery Island field.
Ohio Oil Co.	117	22	Sheridan, Ind., to Lima, Ohio.
Phillips Pipe Line Co.	53	8-6	Wheeler to Sweeny, Tex., 1-1-51.
Phillips Pipe Line Co.	278	10	Borger, Tex., to Yale, Okla.
Phillips Pipe Line Co.	24	8	Thrall to Kansas City, Kans., 3-1-51.
Service Pipe Line Co.	101	8-10	Old Glory field to Bowie, Tex.
Sun Pipe Line Co.	30	4-6-8	Scurry County gathering.
The Texas Co.	27	8	Ventura to Fillmore, Calif., 1-52.
Texas Pipe Line Co.	56	12	Wichita Falls to Chico, Wise County, Tex., 1-15-51.

Table 8—Principal Domestic Products Projects Completed

Great Lakes Pipe Line Co.	355	12	Kansas City through Omaha and Sioux City, Iowa, to Sioux Falls, S. D.
Great Lakes Pipe Line Co.	107	8	Des Moines to Montezuma on to Iowa City, Iowa.
Miami-Valley Corp.	58	8	Dayton to Cincinnati, Ohio, 1-1-51.
Phillips Pipe Line Co.	163	12	Looping from Borger, Tex., to Paola, Kans., 1-52.
Phillips Pipe Line Co.	137	10	Looping (Paola, Kans., E. St. Louis, Ill.), 11-1-52.
Phillips Pipe Line Co.	198	8	Looping from E. St. Louis, Ill., to E. Chicago, Ind., 11-1-51.
Phillips Pipe Line Co.	101	8	E. St. Louis to Decatur, Ill.
Phillips Pipe Line Co.	48	12	Wichita, Kans., to Buffalo, Okla.
Phillips Pipe Line Co.	46	12	Buffalo, Okla., to Borger, Tex.
Phillips Pipe Line Co.	69	12	Paola to Wichita, Kans.
Phillips Pipe Line Co.	40	10	Through Monteau, Cole, Osage, and Gasonade counties, Mo., 1-1-52.
Phillips Pipe Line Co.	48	8	Farmer City to Piper City, Ill.
Phillips Petroleum Co.	50	8	Looping Okla., Kans., Mo., 5-1-51.
Plantation Pipe Line Co.	707	14-18	Baton Rouge to Charlotte, N. C.
Pure Transportation Co.	100	6	Heath to Dayton, Ohio.
Standard Oil Co. (Ind.)	50	8	North of Sugar Creek Refinery, Mo.
Texas Pipe Line Co.	56	10	Lawrenceville, Ill., to Mt. Vernon, Ind., 7-1-51.
Triangle Pipe Line Co.	85	10	El Dorado, Ark., to point on Mississippi River.
Tuscarora Oil Co., Ltd.	26	10	Barneytown scraper trap to East Freedom, Pa.
Tuscarora Oil Co., Ltd.	61	10	Knappenberger to Midland, Pa.
Tuscarora Oil Co., Ltd.	25	10	Indiana, Pa.
Tuscarora Oil Co., Ltd.	34	10	Knappenberger scraper trap to Pittsburgh Junction, Pa.
Tuscarora Oil Co., Ltd.	27	8	Pittsburgh Junction, Pa., to Midland, Pa.
U. S. Army Engineers.	190	6	Searsport to Limestone, Me.

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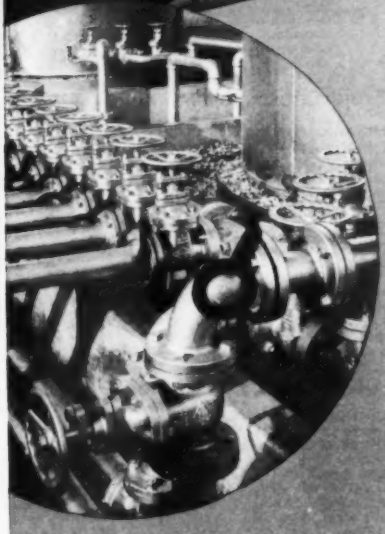

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Table 9—Principal Domestic Natural-Gas Projects Completed

Company—	Miles	Inch	Contractor, location, and completion date
Cities of Booneville and Baldwin, Miss.	96	3-4-6	Booneville and Baldwin, 11-1-51.
Cities Service Gas Co.	177	4-30	Grant, Stanton, Hamilton, Kearny, and Finney counties, Kans., 11-15-51.
Cities Service Gas Co.	40	4-10	Liberal, Kans.
Cities Service Gas Co.	29	16	Hesston to Wichita, Kans.
Cities Service Gas Co.	66	6 to 10	Reclaim—Hutchinson to Wichita, Kans.
Commonwealth Natural Gas Corp.	99	18	Standardsville to Petersburg, Va.
Commonwealth Natural Gas Corp.	69	12	Petersburg, to Norfolk, Va.
Consolidated Gas Utilities Corp.	24	10	Marlow field to Fort Sill, Okla.
Delhi Oil Co.	68	8	Laredo to Lopeno, Tex., 4-1-51.
East Ohio Gas Co.	65	26	Near Petersburg to Cleveland, Ohio, 11-29-51.
El Paso Natural Gas Co.	470	24	San Juan basin, N. M., to Franconia, Ariz., 10-1-51.
Empire Southern Gas Co.	22	2-3-4	Ozona, Crockett Co., Tex., to Ozona distb. system, 12-20-51.
Hope Natural Gas Co.	32	8⅝	Terra Alta, W. Va., to Fairmont, 9-1-51.
Hugoton Production Co.	55	4 to 22	Near Ulysses, Kans.
Humble Oil & Refining Co.	42	10	Anahuac gasoline plant near Anahuac, Tex., to Gulf States Utilities plant near Beaumont, Tex.
Houston Pipe Line Co.	24	18	Houston to Bammel gas field, Harris County, Texas, 12-15-51.
Kansas-Nebraska Natural Gas Co., Inc.	34	12	Palco to Phillipsburg, Kans.
Kansas-Nebraska Natural Gas Co., Inc.	26	6	Albion to Neligh, Neb.
Kansas-Nebraska Natural Gas Co., Inc.	60	8-10-12	Grand Island to Albion, Neb.
Lion Oil Co.	140	6-30	Gathering system for Diamond "M" Sharon Ridge refinery, 12-15-51
Manufacturers Light & Heat Co.	172	16	Renovo, Pa., to Pittsburgh.
Michigan Consolidated Gas Co.	180	24	Austin, Mich., to Detroit.
Michigan Consolidated Gas Co.	31	24	Austin storage fields to Lincoln storage field, Mich., 9-1-51.
Michigan Consolidated Gas Co.	131	24	Austin storage fields to Detroit, 11-1-51.
Michigan Gas Utilities Co.	77		Sturgis, Hillsdale, and Coldwater, Mich., 12-10-51.
Mid-South Gas Co.	40	12	Helena to Forest City, Ark., 3-15-51.
Missouri Central Natural Gas Co.	30	6	Macon to Moberly, Mo.
Montana Dakota Utilities Co.	70	8	Utopia gas field to Havre, Mont., 12-10-51.
New York State Natural Gas Corp.	164	16	Ithaca to Albany, N. Y.
New York State Natural Gas Corp.	70	20	North Oakford, Pa., to Ohio State line.
Niagara Mohawk Power Co.	40	10-12-16	Lateral lines in Utica, N. Y.
Niagara Mohawk Power Corp.	55	10	Fulton to Watertown, N. Y.
Northeastern Gas Transmission Co.	124	24	New York-Mass. state line to point north of Boston.
Northern Natural Gas Co.	108	26	Beatrice, Neb., to Mullenville, Kans., 12-1-51.
Ohio Fuel Gas Co.	20	20	New Albany to Homer, Ohio., 6-1-51.
Ohio Fuel Gas Co.	19	20	Near Columbus to Homer, Ohio, 6-9-51.
Ohio Fuel Gas Co.	40	4-16	Benton, Pavonia, Weaver, storages, Ohio.
Oklahoma Natural Gas Co.	23	24	Depew to Kellyville, Okla., 1-15-52.
Oklahoma Natural Gas Co.	18	12	Crescent to Marshall, Okla.
Oklahoma Natural Gas Co.	53	26	Edmond to Depew, Okla., 3-15-51.
Pan American Gas Co.	40	16	Winnie to Texas City, Tex., 10-1-51.
Panhandle Eastern Pipe Line Co.	323	20-26-30	Looping in Kans., Mo., Ill., Ind., and Ohio, 9-15-51.
Phillips Natural Gas Co.	20	8	Blue Lake to Chocolate Bayou, Tex., 10-51.
Southeastern Michigan Gas Co.	55	12	Birmingham to Port Huron, Mich., 5-15-51.
Southern California Gas Co.	22	22	Simi to Santa Clara River, 10-51.
Southern California Gas Co.	24	30	Inglewood to San Fernando Valley, 11-51.
Southern California Gas Co.	36	6-8	Palmdale to Mojave, Calif.
Southern Natural Gas Co.	120	16	Mitchell Village, Ala., to Bolingbroke, Ga., 3-15-51.
Tennessee Gas Transmission Co.	992	30	Monroe, La., Greenville, Miss., Midland and Portland, Tenn.
The Texas Co.	90	2-24	Gas-gathering system, 10-15-51.
Texas Illinois Natural Gas Pipeline Co.	1,329	12-24-26-30	Corpus Christi area to Joliet, Ill., 11-30-51.
Trunkline Gas Co.	1,300	20-26	McAllen, Tex., to Tuscola, Ill.
Union Gas & Electric	35	8	Bloomington, Ill., to Harris, Ill.
Union Gas & Electric	33	8	Farmer City to Bloomington, Ill., 12-15-51.
United Gas Pipe Line Co.	100	20-26-30	Near Houma to Franklin, La.
United Gas Pipe Line Co.	30	30	Napoleonville to Gonzales, La.
United Gas Pipe Line Co.	65	30	Gonzales, La., to Kosciusko, Miss., 11-51.
United Gas Pipe Line Co.	43	24	Baxterville, La., to McComb, 11-51.
United Gas Pipe Line Co.	90	8-10-12-16	Chalmette to Venice and West Bay field, La., 9-51.
United Gas Pipe Line Co.	87	30	State line to Jackson, Miss., 12-15-21.
United Gas Pipe Line Co.	93	6-16	Fields in Plaquemines Parish to near New Orleans.
United Gas Pipe Line Co.	54	20	Needville to Freeport, 5-1-51.
Wisconsin Power Co.	21	8	Fond-du-lac to Ripon, Wis.
York Gas Co. and Corning Glass Co.	20		York, Pa., and Corning, N. Y.

Table 10—Principal Foreign Crude-Oil Projects Completed

Basrah Petroleum Co.	72	12	Zubair to Fao, Iraq
Montreal Pipe Line Co., Ltd.	68	18	Near Highwater, Que., to Montreal East.
Petroleos Mexicanos	160	11	Minatitlan to Salina Cruz, Mexico.
Shell Caribbean Petroleum Co.	10	20	Across Lake Maracaibo, Venezuela, S. A.
Shell Caribbean Petroleum Co.	11	16	Bachaquero (North) Lagunillas, 5-51.
Shell Caribbean Petroleum Co.	18	4	Mara to Palmarejo.
Winnipeg Pipe Line Co., Ltd.	75	10	Gretna to Winnipeg, Manitoba.

Table 11—Principal Foreign Products Projects Completed

Estrada de Ferro Santos Jundiai	32	10	Santos to Sao Paulo, Brazil.

Table 12—Principal Foreign Natural-Gas Projects Completed

Azienda Generale Italiana Petroli	30	8	Ferrara to Bologna, 7-51.
Canadian-Montana Pipe Line Co.	68	4-16	Pakowki Lake field to Alberta-Montana Border, 12-10-51.
Canadian Western Natural Gas Co., Ltd.	29	8	Jumping Pound to Exshaw, Alta., 9-1-51.
Canadian Western Natural Gas Co., Ltd.	27	6-8-10	Exshaw to Banff and Lethbridge, Alta.
Direccion General del Gas del Estado	62		Comodoro Rivadavia-Caleta Olivia, Argentina.
Northwestern Utilities, Ltd.	35	16	Viking to Shonts, Alta., 8-31-51.
Union Gas Co. of Canada, Ltd.	61	16	Dawn Township, County of Lambton, Province of Ont., 9-1-51.

Production and Proved Remaining Reserves—By Fields

On this and the following several pages are estimates of proved remaining reserves of crude oil and condensate for the country's largest producing fields. Asterisks denote fields with estimated ultimate recovery of over 100 million barrels.

PRODUCTION AND RESERVES—ARKANSAS

(In thousands of barrels)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	January 1, 1952 No. of wells
Atlanta	843	13,700	11,300	55
Buckner	712	9,724	8,276	43
Cairo	660	2,055	5,945	18
Champagnolle	377	18,168	2,832	76
Dorcheat-Macedonia	853	14,976	10,024	103
Fouke	938	8,300	7,700	53
Haynesville	373	3,771	2,229	32
*Magnolia	4,409	68,344	51,656	118
McKamie-Patton	1,215	11,918	18,082	33
Midway	2,688	24,769	25,231	46
*Schuler	2,493	67,403	32,597	92
*Smackover	3,837	430,592	49,408	1,479
Spirit Lake	371	1,994	3,006	29
Stephens	1,482	22,263	13,737	417
Urbana	626	11,112	4,888	161
Village	1,273	13,273	12,727	89
Wesson	3,548	15,607	19,393	167

PRODUCTION AND RESERVES—CALIFORNIA

(In thousands of barrels)

COASTAL DISTRICT

Aliso Canyon	1,999	13,707	18,293	72
Bardsdale	705	4,624	5,376	84
Capitan	536	14,878	8,122	69
*Cat Canyon, West	6,140	52,089	67,911	214
Del Valle	1,730	14,882	17,118	75
*Elwood	1,922	89,900	15,100	67
Gato Ridge	1,029	18,604	9,396	45
Lompoc	2,485	20,498	19,502	97
Newhall-Potrero	2,856	25,782	34,218	80
Oak Canyon	563	5,421	6,579	22
*Orcutt	1,479	112,046	17,954	262
Ramona	1,502	9,387	16,613	116
Padre Canyon	2,249	15,513	24,487	83
Placerita Canyon	3,975	14,984	33,016	352
Rincon	1,317	27,509	17,491	105
San Ardo	2,718	3,506	56,494	218
San Miguelito	4,498	27,694	38,306	85
*Santa Maria Valley	4,492	106,067	63,933	440
South Mountain	2,209	37,155	32,845	220
*Ventura Avenue	23,302	420,893	209,107	788
Zaca Creek	1,656	3,840	13,160	28

LOS ANGELES BASIN

*Brea-Olinda	5,389	213,116	53,884	459
Coyote, East	2,216	62,384	21,616	225
*Coyote, West	3,683	172,483	67,517	313
*Dominguez	4,173	191,239	53,761	337
East Los Angeles	466	2,474	5,526	18
*Huntington Beach	22,511	481,231	204,769	1,332
*Inglewood	4,946	179,789	35,211	410
*Long Beach	8,511	759,884	80,116	1,167
*Montebello	2,018	157,533	22,467	337
Newport	1,593	13,064	25,936	202
Playa Del Rey	623	55,658	4,342	106
*Richfield	2,423	116,754	23,246	354
Rosecrans-Athens	1,642	68,487	16,513	209
Sansinena	1,032	1,779	9,221	34
*Santa Fe Springs	5,146	538,646	51,354	532
*Seal Beach	4,132	126,632	33,368	222
*Torrance	2,517	133,283	26,717	759
*Wilmington	51,057	557,879	422,121	2,382

SAN JOAQUIN VALLEY

Antelope Hills	369	4,948	5,052	37
Antelope Hills, North	363	369	4,631	16
Belgian Anticline	720	2,283	7,717	20

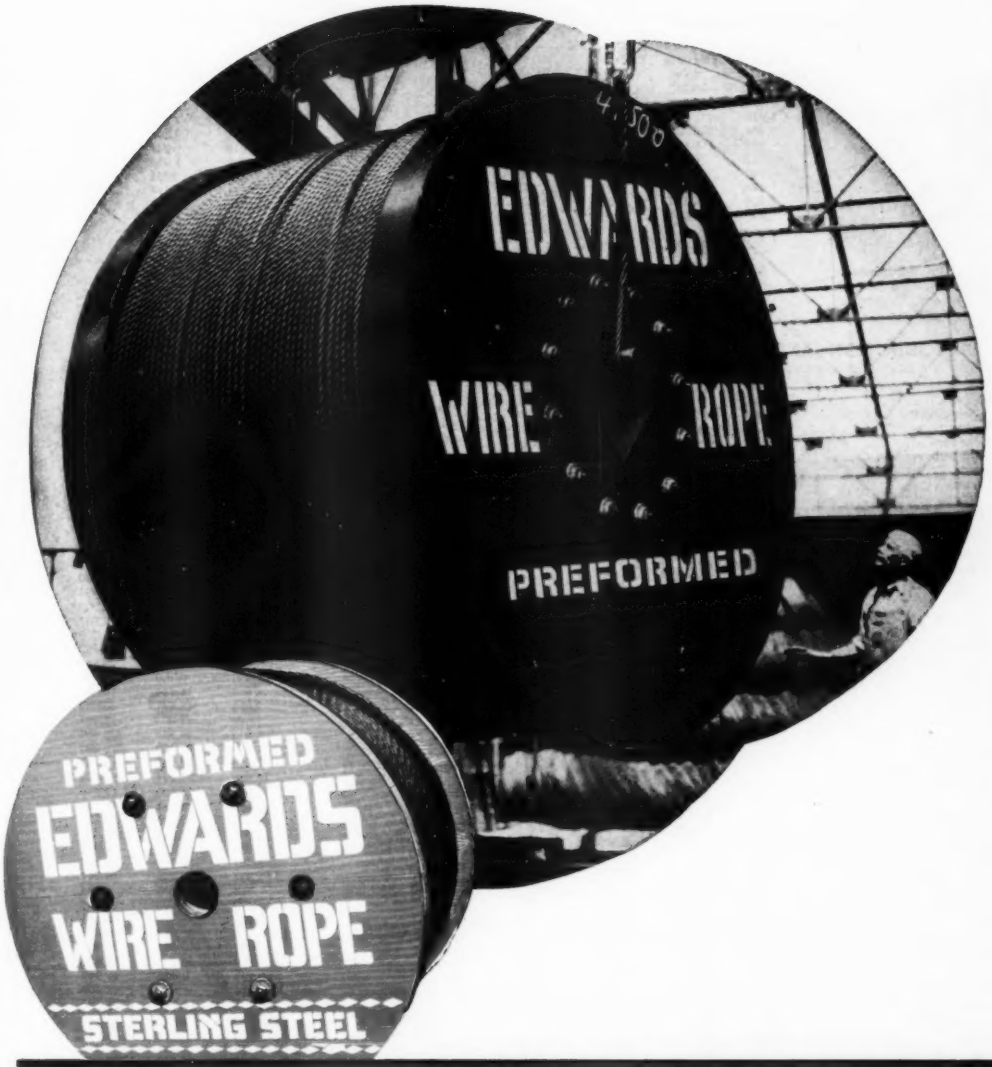
SAN JOAQUIN VALLEY (Continued)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	January 1, 1952 No. of wells
Belridge, North	848	60,643	15,357	55
Belridge, South	2,670	50,543	30,457	647
*Buena Vista	11,174	401,114	118,886	926
Canal	574	15,801	7,199	28
*Coalinga, Eastside	5,707	281,418	58,582	785
Coalinga, Northeast	960	33,279	16,721	36
*Coalinga, Nose	16,253	183,975	176,025	106
*Coalinga, Westside	2,497	169,846	20,154	786
*Coles Levee, North	6,126	61,511	53,489	129
Coles Levee, South	2,218	20,456	25,544	40
*Cuyama, South	14,106	23,759	126,241	235
Cymric	2,170	24,836	30,164	215
Edison	4,862	39,902	45,098	417
*Elk Hills	2,450	207,284	442,716	768
Fruitvale	3,329	51,645	28,355	256
Gosford, East	826	1,897	8,103	24
Greeley	4,622	50,827	34,173	86
Guijarral Hills	4,472	12,914	52,086	73
Helm	732	8,874	8,126	47
Jacalitos	1,163	12,280	17,720	108
Kern Bluff	519	2,416	7,584	119
*Kern Front	2,778	76,458	28,542	678
*Kern River	4,703	314,054	45,946	2,758
*Kettleman North Dome	9,100	381,473	118,527	331
Lost Hills	2,080	68,970	20,030	623
*McKittrick	1,030	97,528	14,472	223
McKittrick Front	648	7,786	6,214	71
*Midway-Sunset	12,563	772,759	157,241	3,022
Morales Canyon	411	658	4,342	21
*Mount Poso	2,646	94,682	30,318	314
Mount Poso, North	371	8,339	3,661	79
Mountain View	1,172	54,029	10,971	164
Paloma	4,904	35,746	60,254	99
Pleasant Valley	895	9,634	10,366	19
Premier	897	14,937	8,063	182
Race Track Hill	530	4,023	5,977	43
Raisin City	1,776	10,608	12,392	88
*Rio Bravo	4,086	59,412	40,588	93
Riverdale	787	10,481	7,519	41
Round Mountain	1,283	41,126	16,874	182
Russell Ranch	7,118	22,796	57,204	150
Salt Creek	1,475	9,167	20,833	60
Tejon Ranch	741	5,530	9,470	97
Ten Section	1,887	50,441	24,559	114
Willow Springs	1,347	2,218	9,782	124

PRODUCTION AND RESERVES—ILLINOIS

(In thousands of barrels)

Albion	1,231	10,646	9,354	336
Allendale	310	6,053	3,947	250
Assumption, North	824	3,132	6,868	127
Benton	2,295	23,438	16,562	238
Boyd	687	8,165	6,835	112
Bungay	877	6,131	8,869	162
Centralia	946	36,309	11,691	562
*Clay City	7,031	140,547	44,453	2,517
Cordes	679	4,960	5,040	130
Dale	2,215	43,206	21,794	757
Golden Gate	611	4,866	7,134	141
Herald	365	3,211	3,789	174
Inman, East	837	9,258	7,742	322
Inman, West	429	1,908	4,092	153
Iola	377	7,244	3,756	187
Johnsonville	664	26,764	7,236	343
*Loudon	6,127	163,130	46,870	2,062
Marine	787	7,333	7,667	147
Mattoon	473	9,977	5,023	409
New Harmony	3,504	66,724	8,276	1,565
Parkersburg	590	7,120	4,880	176
Patoka	458	10,549	5,451	458
Phillipstown	1,092	11,253	8,747	317



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ILLINOIS (Continued)

	1951 production	January 1, 1952 Cumulative	Estimated reserves	No. of wells
Roland	601	10,688	5,312	213
St. James	425	11,794	4,206	163
Sailor Springs	1,445	19,085	10,915	607
*Salem	3,404	219,388	60,612	2,187
Stokes	344	6,850	3,150	172
Storms	414	6,617	3,383	195
Walpole	386	4,873	3,127	98
Woodlawn	372	12,421	3,579	143
*Bridgeport	1,936	246,340	38,660	3,562
*Robinson	1,590	160,084	14,916	6,681
Griffin, Indiana	1,264	31,804	13,196	528
Hitesville, Kentucky	558	6,333	5,667	170
Morganfield, S., Kentucky	946	2,698	9,302	129
Uniontown, Kentucky	589	12,315	5,685	253

PRODUCTION AND RESERVES—KANSAS

(In thousands of barrels)

Augusta	379	45,720	4,280	168
Barry	833	5,334	8,666	60
Bemis-Shutts	4,287	68,330	26,670	556
Berland	1,346	2,570	2,430	126
Bloomer	2,782	38,538	26,462	290
Bornholt	403	13,435	4,565	134
Boyd	671	3,000	7,000	77
Bryant	561	1,100	5,900	66
Burnett	3,044	40,203	29,797	276
Burnett, Northwest	397	2,203	3,797	35
Burnett, Southwest	622	2,905	7,095	79
Burrton-Haury	1,026	46,485	8,515	340
Carmi	589	9,017	5,983	108
Chance	410	870	5,130	50
Chandler "A"	432	1,046	4,954	34
Chase	2,786	60,793	24,207	540
Chitwood	611	6,433	5,567	74
Drach	503	4,816	5,184	56
Edwards	882	13,286	6,714	102
Elbing	733	22,568	7,432	85
*El Dorado	3,202	207,929	47,071	1,834
Fairport	1,135	23,347	11,653	197
Fankhouser	533	3,678	5,322	63
Geneseo	2,119	30,161	19,839	225
Gorham	2,452	52,021	19,979	470
Graber	476	9,918	4,082	119
Hall-Gurney	3,637	50,979	29,021	896
Hammer, North	383	778	5,222	54
Huffstutter	649	1,590	6,410	108
Iuka	515	2,168	4,832	46
*Kraft-Prusa	6,326	55,703	64,297	693
Lindsborg	510	6,292	5,708	104
Marcotte	399	1,354	4,646	43
Max	691	4,314	5,686	74
Morel	2,301	12,796	23,204	195
Northampton	557	1,528	4,472	32
Otis-Albert	558	8,652	6,348	141
Polhamus	593	2,088	5,912	39
Ray	1,822	13,010	16,990	146
Richardson	664	11,232	6,768	67
Ritz-Canton	501	42,197	4,803	182
Russell	404	9,158	2,842	76
Seeley-Wick	760	17,522	7,478	326
*Silica	4,950	99,409	50,591	802
Stoltenberg	1,760	33,376	16,624	361
Thrall-Agard	1,324	25,328	9,672	253
*Trapp	7,686	130,852	79,148	1,345
Virgil, North	379	24,056	3,944	375
Zenith-Peace Creek	583	37,533	12,467	246
Eastern Kansas stripper	4,304	180,870	44,130	8,476

PRODUCTION AND RESERVES—LOUISIANA

(In thousands of barrels)

NORTH LOUISIANA

Bellevue	364	13,496	4,504	324
Benton	1,244	5,730	9,270	13
*Caddo	4,976	194,716	55,284	3,123
Catahoula Lake, West	666	1,541	4,459	32
Cotton Valley	2,719	67,145	27,855	172
*Delhi-Big Creek	8,095	53,574	121,426	392
DeSoto	889	62,289	5,711	145
*Haynesville	3,937	111,333	33,667	380
Haynesville, East	1,888	4,573	15,427	71
Holly Ridge	551	8,066	6,934	41
Homer	817	80,699	11,301	324
Knowles	1,247	3,953	10,047	31
Lake St. John	6,800	44,042	50,958	146
Lisbon	2,919	23,444	28,556	304
Little Creek	357	7,533	4,467	69

NORTH LOUISIANA (Continued)

	1951 production	January 1, 1952 Cumulative	Estimated reserves	No. of wells
Nebo	2,278	29,101	20,899	166
Olla	1,859	32,144	22,856	173
Ora	660	7,298	6,702	214
*Rodessa	1,051	95,054	11,946	255
Ruston	549	887	7,113	13
Saline Lake	612	1,656	6,344	17
Sarepta, South	492	696	5,304	8
Sligo	544	7,617	4,383	66
Urania	876	33,626	8,374	253
Waskom-Greenwood	721	1,072	3,928	58

SOUTH LOUISIANA

Anse la Butte	2,432	26,569	23,431	90
Avery Island	3,011	14,670	30,330	39
Avondale	848	1,106	8,894	16
Bancroft	1,118	7,013	12,987	31
Barataria	1,874	16,251	18,749	33
Barataria, West	1,406	6,712	15,288	24
Bay de Chene	1,235	3,099	14,901	17
Bay St. Elaine	2,691	11,020	26,980	48
Bay Marchand	2,425	4,810	25,190	25
Bayou Blue	1,141	8,804	11,196	66
Bayou des Allemands	924	4,320	10,680	28
Bayou Mallet	1,221	4,296	13,704	54
Bayou Sale	5,088	38,537	51,463	76
Big Island	1,239	2,321	12,679	39
Black Bayou	768	17,239	8,761	22
Bosco	689	31,701	8,299	36
Bully Camp	856	2,734	9,266	17
*Caillou Island	6,509	63,702	46,298	104
Cankton, North	937	4,622	10,378	40
Chacahoula	879	8,707	9,293	34
Charenton	1,145	21,303	13,697	108
Cox Bay	1,138	1,170	11,830	25
Crowley, North	1,661	21,509	18,491	49
David Haas	1,109	3,958	12,042	21
Delacroix Island	813	4,032	9,968	20
Delta Duck Club	972	4,292	10,708	17
*Delta Farms	7,194	46,417	53,583	117
DeQuincy	683	1,292	8,708	19
Dog Lake	1,337	8,700	13,300	30
Duck Lake	1,093	1,714	10,286	29
Egan	2,094	13,031	26,969	70
Eola	570	27,003	5,997	53
*Erath	5,245	46,950	78,050	31
Fordoche	1,059	1,920	10,080	32
Garden Island Bay	1,562	18,293	16,707	60
Gibson and East	1,468	27,574	14,426	50
Golden Meadow	4,832	45,430	49,570	239
Good Hope	2,452	13,944	24,056	34
Grand Bay	3,831	35,400	39,600	74
Gueydan and West	2,321	22,543	23,457	53
Hackberry, East	1,099	44,691	11,309	55
Hackberry, West	2,467	32,303	27,697	74
Horseshoe Bayou	1,334	8,753	16,247	18
Hurricane Creek	716	2,196	9,804	26
Iberia	1,470	42,654	17,346	54
*Iowa	2,231	71,369	28,631	69
Jeannette, South	799	2,392	9,608	16
*Jennings	887	102,969	17,031	83
*Lafitte	4,507	70,079	54,921	76
Lake Chicot	1,104	9,055	12,945	25
Lake Mongoulois	814	3,534	11,466	14
Lake Pelto	2,132	14,437	20,563	39
Lake Salvador	2,118	16,396	23,604	29
Lake Verret, West	1,825	11,863	18,137	50
La Pice	726	6,750	8,250	18
Leeville	2,242	39,453	22,547	100
Main Pass-Block 69	2,051	3,721	24,279	17
Paradis	3,654	37,899	47,101	80
Pine Prairie	1,038	14,812	11,188	66
Pointe-a-la-Hache	2,511	4,438	25,562	54
Port Barre	1,477	23,020	14,980	78
Quarantine Bay	3,974	37,009	42,991	67
Romere Pass	2,232	2,838	24,162	36
St. Gabriel	1,783	17,737	18,263	40
Section 28 Dome	1,135	4,697	15,303	40
Sulphur Mines	725	23,293	7,707	63
Sunshine	1,271	2,208	13,792	20
Tepetate	599	18,091	8,909	52
Tepetate, North	1,020	5,985	11,015	54
Tepetate, West	1,716	12,595	19,405	44
University	2,187	31,979	28,021	67
*Venice	5,756	39,520	60,480	76
Ville Platte	1,449	45,264	17,736	226
*Vinton	3,961	72,006	42,994	127
*Weeks Island	8,112	16,700	83,300	75
West Bay	2,915	16,972	31,028	48
West Cote Blanche Bay	2,375	14,023	15,977	46
Whitecastle	1,672	18,899	19,101	37
White Lake, East	1,431	11,218	18,782	27

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S12-3

PRODUCTION AND RESERVES—MICHIGAN

(In thousands of barrels)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	No. of wells
Beaver Creek	640	2,717	3,283	86
Coldwater	1,493	11,378	5,622	71
Deep River	2,008	16,844	13,156	96
Kawkawlin	632	7,126	4,874	288
Kimball Lake	571	5,017	4,983	77
Pentwater	723	3,856	6,144	132
Porter-Yost	387	45,075	4,925	264
Reed City	651	38,336	5,664	172
Stony Lake	891	4,020	4,980	75

PRODUCTION AND RESERVES—MISSISSIPPI

(In thousands of barrels)

Baxterville	6,381	27,569	67,431	173
Brookhaven	4,251	24,839	35,161	105
Carthage Point	372	2,376	3,624	9
*Cranfield	4,435	35,151	64,849	80
Eucutta	1,774	15,784	21,216	127
Gwinville	517	2,221	5,779	83
*Heidelberg	3,425	28,337	81,663	67
La Grange	3,797	16,651	33,349	141
Mallalieu	2,609	19,994	25,006	79
Pickens	858	14,200	10,800	36
*Tinsley	5,117	122,900	57,100	284
Yellow Creek	1,676	4,973	15,027	110

PRODUCTION AND RESERVES—NEW MEXICO

(In thousands of barrels)

Arrowhead	988	17,856	17,144	116
Bagley	1,662	2,321	17,679	23
Brunson	2,515	12,079	25,921	102
Cooper-Jal	1,207	25,806	11,194	131
Crossroads	737	1,400	10,600	10
Denton	873	985	19,015	18
Drinkard	5,037	28,085	51,915	431
*Eunice-Monument	10,590	216,711	143,289	939
Grayburg-Jackson	1,545	26,927	18,073	354
Hare	1,277	2,708	12,292	37
*Hobbs	4,380	135,634	54,366	259
Langlie-Mattix	1,700	27,953	18,047	423
Maljamar	1,829	23,215	26,785	262
Paddock	1,178	7,714	12,286	102
*Vacuum	4,865	57,540	67,460	408

PRODUCTION AND RESERVES—OKLAHOMA

(In thousands of barrels)

Allen (Deep)	1,447	63,802	16,198	349
Alma, North	1,067	2,717	7,283	101
Apache	1,470	18,996	13,004	42
*Avant	489	100,572	9,428	615
Bebee	1,073	20,512	9,488	353
*Bowlegs	1,178	132,700	17,300	182
Brock, West	982	3,737	4,263	99
*Burbank	2,318	232,810	97,190	1,681
Burbank, South	776	47,965	12,035	239
Cache Creek	1,289	9,548	5,452	291
*Cement	4,127	64,234	45,766	680
Chitwood	636	2,712	5,288	17
Coon Creek	1,432	8,342	9,658	40
Crescent	334	23,187	8,813	123
Cromwell	564	63,964	6,036	197
Cumberland	3,475	40,230	34,770	143
*Cushing	2,816	388,015	61,985	1,570
Davenport, South	460	3,193	2,807	117
*Earlsboro	469	132,695	7,305	119
Edmund	359	24,224	3,776	63
*Edmond, West	3,482	95,480	44,520	737
*Elk City	7,426	13,274	106,726	178
Empire-Comanche	585	30,928	6,072	408
Eola	891	2,276	5,724	13
*Fitts	938	109,155	10,845	458
Fourdee	438	2,547	3,453	91
Fox-Graham	3,196	49,396	25,604	516
Garber	398	60,362	4,638	425
*Glennpool	2,502	243,598	31,402	1,731
*Golden Trend	17,393	64,709	135,291	1,077
Happy Valley	705	1,901	4,099	63
*Healdton	2,267	215,599	29,401	1,990
*Hewitt	3,694	117,760	32,240	1,139
Hoover, Northwest	887	4,284	5,716	156
Knox	1,725	25,321	16,679	330
Lauderdale	419	15,609	4,391	149
*Little River	945	124,979	10,021	176
Lone Grove, Southwest	934	8,342	7,658	128
Lucien	978	37,636	4,364	142
Marshall	370	13,064	1,936	28
Maud	632	13,853	6,147	75
*Oklahoma City	6,303	681,570	88,430	617
Olympic	1,485	16,339	11,661	298

OKLAHOMA (Continued)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	No. of wells
Oscar	411	14,378	3,622	241
Palacine, South	2,288	4,178	10,822	187
Pauls Valley	957	19,383	8,617	68
Perry, Northwest	435	1,788	4,212	26
Ramsey	728	14,993	7,007	32
Ringwood	2,288	4,567	45,433	218
*Seminole City	1,207	156,180	18,820	310
*Sholem Alechem	10,557	73,424	76,576	900
Soldiers Creek	653	6,484	5,516	318
Sparks, East	1,397	1,640	8,360	76
Stroud	539	18,674	4,326	269
*St. Louis	1,560	175,858	24,142	402
*Tatums	3,378	67,028	38,972	1,031
*Tonkawa	210	125,066	2,934	87
*Velma	15,695	66,137	138,863	1,334
Velma, West	394	3,379	3,621	45
Watchorn, East	576	6,979	3,021	34
Wildhorse	396	16,267	3,733	373
Witcher	1,655	7,156	7,844	178
Yale-Quay	1,352	29,683	10,317	239
Northeast Okla. stripper	5,919	400,079	89,921	13,347

PRODUCTION AND RESERVES—ROCKY MOUNTAIN

(In thousands of barrels)

COLORADO				
Iles Dome	442	13,970	6,030	25
*Rangely	22,071	97,530	177,470	531
Wilson Creek	2,819	21,510	28,490	31
MONTANA				
Big Wall	725	1,406	6,594	17
Cat Creek	328	18,373	3,627	177
*Cut Bank	2,883	69,869	40,131	1,123
Elk Basin	1,706	13,021	31,979	56
Kevin-Sunburst	1,411	56,598	18,402	1,455
Pondera	801	9,744	8,256	232
UTAH				
Ashley Valley	984	2,503	7,497	30
WYOMING				
Big Muddy	874	33,019	11,981	199
Big Sand Draw	2,111	11,246	38,754	13
Bonanza	553	553	19,447	9
Byron	2,022	26,976	23,024	51
Circle Ridge	617	3,761	11,239	25
Cole Creek and South	1,293	6,783	18,217	40
Crooks Gas	632	4,376	7,624	9
*Elk Basin	6,799	51,057	103,943	243
Frannie	3,555	22,536	27,464	107
Garland	3,131	19,144	30,856	83
Glen Rock, South	1,279	1,398	13,602	25
Grass Creek	1,801	41,364	18,636	351
Hamilton Dome	3,860	23,334	36,666	91
Horse Creek	428	2,097	5,903	28
LaBarge	356	12,170	3,830	142
*Lance Creek	2,334	88,701	31,299	235
Little Buck Creek	929	3,383	8,617	26
Little Buffalo Basin	1,132	6,081	11,919	26
Little Sand Draw	386	753	7,247	7
Lost Soldier	3,260	47,695	32,305	48
Meadow Creek and N.	2,147	3,340	36,660	105
Mush Creek area	3,357	13,081	36,919	393
*Oregon Basin	3,807	54,466	45,534	190
Pilot Butte	660	4,288	5,712	31
Quealy	531	4,442	3,558	22
Rock River	576	28,827	7,173	55
Sage Spring Creek	764	913	9,087	11
*Salt Creek	4,062	343,734	56,266	1,790
Steamboat Butte	3,146	18,157	31,843	31
Sussex	938	1,990	10,010	62
Wertz	1,837	21,665	18,335	27
Winkleman Dome	816	4,147	7,853	9
Worland	1,635	8,767	23,233	28

PRODUCTION AND RESERVES—TEXAS†

(In thousands of barrels)

SOUTHWEST TEXAS				
RAILROAD DIST. 1:				
Charlotte	2,482	9,508	22,492	309
*Darst Creek	2,824	78,643	31,357	363
*Luling Branyon	1,969	95,980	24,020	609
RAILROAD DIST. 4:				
*Agua Dulce and Stratton	8,711	90,019	134,981	466
Borregas	1,355	4,068	20,932	58

†Data for 1951 production (November and December estimated) and number of wells furnished by C. D. Lockwood, M & M Building, Houston.

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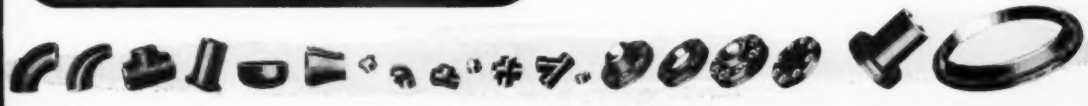

HUDSON SOLO-AIRE EXCHANGERS

Pictured above is an installation of HUDSON SOLO-AIRE JACKET WATER COOLERS providing cool water to the power cylinders, compressor cylinders, and lubricating oil coolers of ten 800 horsepower gas engine driven compressors. The coolers, using air as the cooling medium, and operating with inlet air temperatures ranging seasonally from below zero to 105° F, deliver cool jacket water at a *uniform, controlled* temperature the year around.

For this installation the great expense of obtaining and treating raw water determined the selection of HUDSON SOLO-AIRE units—rather than HUDSON water cooling tower with HUDSON water-cooled units. The use of air-cooled units in this compressor station precluded the loss through evaporation of about 90 gallons per minute of raw water.

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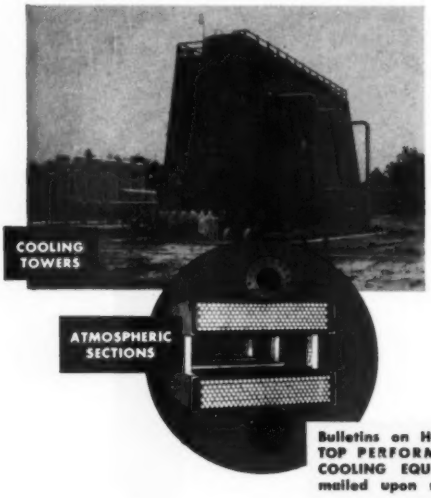

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HUDSON

ENGINEERING CORPORATION

FAIRVIEW STATION • HOUSTON, TEXAS

SOUTHWEST TEXAS (Continued)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	No. of wells
Brayton	1,276	8,009	26,991	62
Colorado	931	11,680	10,320	190
Conoco Driscoll	937	13,597	11,403	59
Flour Bluff and East	1,013	17,562	12,438	100
Fulton Beach	1,825	4,231	20,769	105
Garcia	1,339	9,109	15,891	126
Government Wells	1,559	67,676	17,324	558
Hoffman	2,164	22,376	22,624	509
Kelsey	3,024	18,090	41,910	246
*La Gloria	5,355	38,322	111,678	253
Loma Novia	940	36,734	13,266	360
London Gin	1,363	2,385	15,615	69
Midway	1,603	14,649	17,351	112
Mustang Island	1,205	1,293	13,707	45
Plymouth and East	4,744	57,586	40,414	247
Portilla	3,238	4,270	30,730	56
Richard King	870	10,889	9,111	83
Rincon	3,744	26,135	38,865	236
Saxet	1,229	71,049	18,951	117
*Seeligson	14,511	90,956	409,044	856
Seven Sisters	1,887	34,094	25,906	341
Sinton	2,570	4,391	27,609	151
Sun and North	1,263	13,595	16,405	125
Taft	1,501	14,146	17,854	128
*Tijerina-Canales-Blucher	3,975	22,455	97,545	182
White Point, East	3,409	46,003	41,997	274
Willamar	2,237	24,572	35,428	246

TEXAS GULF COAST

RAILROAD DIST. 2:				
Bloomington	1,976	7,872	20,128	140
Bonnie View	970	6,291	9,709	80
Burnell-Tulsita	3,573	12,083	37,917	109
Falls City	1,366	8,140	21,860	72
Ganado	1,298	11,968	18,032	118
*Greta	3,641	58,582	51,418	211
Heyser	1,689	36,871	23,129	183
La Rosa	816	13,645	11,355	65
La Ward, North	792	8,228	9,772	100
Lolita	1,837	21,752	20,248	237
McFaddin	1,813	19,512	20,488	121
Placedo	2,323	33,133	26,867	253
*Refugio	2,660	64,837	40,163	243
Roche	941	3,740	11,260	47
Slick (Wilcox)	984	10,276	14,724	50
*Tom O'Connor	14,051	172,067	287,933	657
*West Ranch	7,635	13,098	186,902	542
RAILROAD DIST. 3:				
Amelia	1,085	19,458	12,542	88
*Anahuac	7,816	108,852	156,148	329
*Barbers Hill	2,028	93,356	26,644	142
Bay City and North	1,790	21,378	18,622	92
Beaumont, West	704	9,894	6,106	69
Boling	1,100	13,853	12,147	135
Cedar Point	747	7,644	7,356	35
Chocolate Bayou	5,107	15,691	44,309	95
Clear Lake	865	12,301	9,699	44
*Conroe and West	14,270	307,471	292,529	852
Dyersdale	1,462	10,065	17,935	98
Esperson Dome	1,505	18,484	17,516	101
Fairbanks	1,407	30,662	19,338	265
Fannett	1,750	22,441	19,559	68
Fig Ridge	936	14,625	11,375	70
Gillock	3,786	24,608	40,392	191
*Goose Creek	2,889	89,069	35,931	313
Hankamer	738	9,635	8,365	66
*Hastings	16,789	213,246	286,754	649
High Island	2,407	31,539	24,461	117
*Hull	4,647	115,011	54,989	275
*Humble	1,261	136,460	23,540	269
*Katy and North	7,936	37,220	87,780	66
Lake Creek	950	10,598	14,402	3
Livingston	1,413	19,394	18,606	140
Lovells Lake	1,356	18,010	16,990	103
Magnet Withers	2,119	35,748	24,252	232
Manvel	2,415	46,595	33,405	157
Markham	1,341	22,292	15,708	87
Midfields	919	2,948	12,052	42
North Withers	2,146	27,810	22,190	152
*Old Ocean	6,322	65,728	134,272	145
Oyster Bayou	3,567	23,832	48,168	36
Pickett Ridge	814	8,571	9,429	65
Pierce Junction	1,819	43,329	18,671	106
Port Neches	1,630	15,897	19,103	108
Raccoon Bend	1,889	48,551	26,449	159
Red Fish Reef and East	850	7,163	8,837	38
Segno	825	17,794	12,206	101
Sheridan	1,812	10,305	24,695	2
Silsbee and West	2,244	14,128	25,872	64

TEXAS GULF COAST (Continued)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	No. of wells
*Sour Lake	2,028	90,187	24,813	303
South Houston	1,199	21,267	18,733	72
South Liberty	1,631	23,277	26,723	132
*Spindletop	522	130,474	7,526	170
Stowell	222	32,215	37,785	13
Sugarland	1,404	47,495	22,505	44
Sugar Valley	1,954	10,203	24,797	116
*Thompson	13,020	165,937	154,063	344
Tomball	2,457	51,183	33,817	387
Village Mills and East	3,213	6,222	33,778	136
*Webster	15,179	165,196	284,804	207
*West Columbia	2,325	113,427	26,573	152

EAST TEXAS

RAILROAD DIST. 5:				
*Mexia	327	102,346	5,654	125
Opelika	1,503	15,715	14,285	56
Pickton	1,892	4,685	19,315	115
*Powell	322	119,541	5,459	127
Sherman	1,519	4,207	20,793	104
Sulphur Bluff	779	19,486	7,514	64
*Van	9,792	220,911	179,089	579
RAILROAD DIST. 6:				
Carthage	1,006	12,897	9,103	40
Cayuga	1,766	46,946	18,054	187
Chapel Hill	1,260	8,126	11,874	63
Coke	882	7,236	8,764	85
*East Texas field	99,646	2,877,058	2,222,942	21,468
*Hawkins	13,333	131,617	368,383	615
Long Lake and East	1,891	29,699	15,301	167
Merigale-Paul	1,004	5,826	12,174	150
New Hope	2,334	9,563	30,437	64
Pewitt Ranch	1,925	2,386	19,614	118
Pine Mills	1,508	1,907	18,093	89
Quitman	3,119	22,631	27,369	153
Rodessa	743	61,659	8,341	246
*Talco	6,738	129,175	70,825	716
Waskom	942	3,127	11,873	97

NORTH TEXAS

RAILROAD DIST. 7-B:				
Hamlin, East	961	1,084	13,916	65
Reddin	672	5,815	9,185	144
Roundtop	2,551	6,241	23,759	155
Wimberly	1,141	10,457	13,543	187
RAILROAD DIST. 9:				
Hildreth	719	15,116	14,884	129
Hull-Silk-Sikes	2,299	43,011	36,989	429
Joy	1,055	8,896	13,104	190
Kempner	792	2,802	12,198	109
*K.M.A.	2,806	133,912	46,088	1,423
Reno	1,063	2,100	11,900	115
Richardson	744	1,134	8,866	39
Rusmag	857	1,048	8,952	61
Sivells Bend	1,068	7,349	12,651	61
Vogtsberger	1,712	4,957	18,043	173
Walnut Bend	4,500	29,956	45,044	347
Worsham Steed	1,636	3,128	6,872	129

WEST TEXAS

RAILROAD DIST. 7-C:				
Barnhart	1,004	11,294	28,706	76
Benedum	2,553	6,814	43,186	98
*Big Lake	999	111,938	18,062	181
Cree-Sykes	1,555	1,595	18,405	131
Fort Chadbourne	3,868	4,615	35,385	207
Jameson	2,787	7,369	37,631	119
*McCamey	3,431	84,508	45,492	920
Millican	863	1,449	13,551	34
*Pegasus	3,998	5,553	144,447	63
Pembrook	1,082	1,102	13,898	89
Susan Peak	1,676	3,078	26,922	69
Todd	3,812	23,883	56,117	100
Vaughn	1,621	2,681	17,319	228
World	1,426	16,391	13,609	165
RAILROAD DIST. 8:				
Abell	2,042	11,282	28,718	156
Adair	1,863	4,794	20,206	144
Andector	7,156	20,370	69,630	127
Anton Irish	1,891	9,847	20,153	160
Bedford	707	4,279	13,721	12
Cedar Lake	1,964	9,242	25,758	140
*Cogdell	7,629	10,682	89,318	316
*Cowden, North and South	10,542	114,208	135,792	1,137
*Diamond M	9,175	16,757	163,243	385
*Dollarhide	8,316	23,593	86,407	304
Embar	1,268	12,052	12,948	35
*Foster	5,457	69,233	55,767	548
Fuhrman Mascho	1,580	15,524	22,476	285
*Fullerton	10,855	83,248	241,752	713

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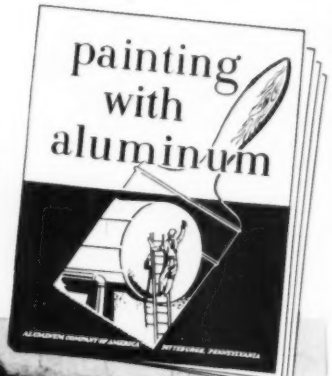

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WEST TEXAS (Continued)

	1951 production	January 1, 1952 Cumulative	January 1, 1952 Estimated reserves	No. of wells
Garza	3,716	15,069	34,921	429
Germania	774	795	11,205	44
*Goldsmith	21,221	134,442	215,558	1,825
Good	2,209	3,817	24,183	47
*Hendrick	1,161	217,187	22,813	203
*Howard Glasscock	5,853	151,009	63,991	1,038
Iatan E. Howard and N. Jordan	1,197	28,504	13,496	487
	4,573	28,257	41,743	349
*Kelly-Snyder	28,020	53,645	546,355	1,059
*Keystone	13,031	100,699	249,301	892
*Levelland	12,683	42,615	157,385	1,744
*McElroy	8,447	209,636	120,364	921
Mabee	864	7,160	12,840	94
Martin	3,384	12,277	37,723	80
Means	1,674	19,220	20,780	244
Midland Farms	6,210	13,614	61,386	236
Monahans	552	5,284	14,716	51
Pecos Valley	583	6,175	13,825	306
Penwell	837	32,253	12,747	185
Reinecke	3,101	4,338	70,662	67
Salt Creek	2,402	2,983	57,017	68
Sand Hills	4,691	38,728	58,272	449
*Seminole	7,213	66,416	113,584	396
Shafter Lake	3,152	11,179	43,821	111
Sharon Ridge	5,972	16,460	63,540	972
*Slaughter	15,197	191,671	303,329	2,316
*Snyder and North	1,180	8,373	141,627	151
Spraberry	1,077	1,921	15,079	48
Sweetie Peck	1,677	2,205	57,795	35
Tex-Harvey	5,455	5,855	44,145	309
Three Bar	2,000	5,436	19,564	57
Toborg	2,994	17,978	32,022	962
Tunstill	1,190	3,421	14,579	125
*T.X.L.	14,672	91,415	158,585	312
Vealmoor	4,241	6,151	43,849	130
Von Roeder	1,252	1,417	13,583	37
Waddell	1,296	14,641	15,359	177
*Ward, North Estes	3,079	72,999	47,001	931
Ward, South	3,715	36,210	48,790	494
*Wasson	22,465	238,541	411,459	1,675
Welch	1,211	7,273	14,727	179
Wellman	897	960	9,040	16
Wheeler	2,637	17,132	32,868	91
Yarbrough and Allen	2,031	4,213	20,787	45
*Yates	14,162	336,806	413,194	621

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Exploratory and Development Drilling—1951

Here's when and where it occurred, and summaries of the results

SOUTHWEST TEXAS
(District 1)

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	53	29	0	24	163,623
February	34	19	0	15	79,554
March	62	37	0	25	154,638
April	43	22	2	19	144,523
May	51	22	2	27	187,793
June	51	22	1	28	156,665
July	33	16	1	16	129,271
August	56	29	0	27	163,924
September	59	31	2	26	137,036
October	36	14	0	22	94,518
November	70	35	0	35	187,250
December	53	25	2	26	148,817
Total	601	*301	10	‡290	1,747,612

*Incl. 2 distillate. ‡Incl. 1 service.

SOUTHWEST TEXAS
(District 1)

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	22	4	0	18	66,859
February	8	1	0	7	21,952
March	20	2	0	18	56,026
April	19	5	0	14	78,378
May	25	1	2	22	98,946
June	18	1	1	16	65,872
July	14	2	1	11	64,067
August	25	3	0	22	89,755
September	27	2	1	24	73,559
October	19	2	0	17	47,354
November	30	4	0	26	110,103
December	22	2	1	19	85,878
Total	249	29	6	214	858,749

SOUTHWEST TEXAS
(District 1)

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Atascosa	32	8	0	24	117,192
Bastrop	20	1	0	19	68,966
Bell	7	0	0	7	11,754
Bexar	11	2	0	9	10,865
Caldwell	8	3	0	5	17,002
Dimmit	5	0	0	5	31,950
Frio	29	6	1	22	131,934
Gonzales	4	1	0	3	17,696
Guadalupe	10	0	0	10	22,554
Kerr	4	0	0	4	11,698
LaSalle	19	1	0	18	99,951
McMullen	22	2	4	16	103,065
Medina	5	0	0	5	9,290
Milam	18	1	0	17	35,342
Travis	7	0	0	7	8,047
Val Verde	3	0	1	2	15,255
Williamson	16	1	0	15	25,839
Wilson	18	3	0	15	77,181
Miscellaneous	11	0	0	11	43,168
Total	249	29	6	214	858,749

SOUTHWEST TEXAS
(District 1)

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Bateman	5	3	0	2	11,346
Big Foot	55	52	0	3	184,600
Charlotte	11	5	1	5	55,949
Cooksey	4	4	0	0	6,090
Darst Creek	41	39	0	2	103,837
East Floresville	12	11	0	1	33,026
Elm Creek	23	23	0	0	20,030
Elroy	13	5	0	8	13,067
Gas Ridge	10	10	0	0	4,660
Hindes	4	3	0	1	22,921
La Parita	10	4	0	6	14,660
Luling	6	3	0	3	11,525
Luling-Branyon	62	54	0	8	136,850
Minerva-Rockdale	5	1	0	4	4,269
Pearsall	13	13	0	0	72,701
Ronnie-Queen City	4	2	0	2	3,541
Salt Flats	5	4	0	1	13,027
S. Campana	4	3	1	0	12,276
S. Imogene	10	9	0	1	18,142
Miscellaneous	55	24	2	29	146,286
Total	352	272	4	76	883,863

TEXAS GULF COAST
(District 2)

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	64	28	10	26	378,310
February	43	17	12	14	254,626
March	75	33	11	31	446,112
April	57	33	6	18	304,283
May	67	30	9	28	406,380
June	60	20	10	30	345,706
July	58	17	10	31	348,139
August	73	34	1	38	460,653
September	68	27	11	30	409,255
October	53	25	8	25	367,187
November	80	36	9	35	472,532
December	72	36	6	30	431,296
Total	775	*336	103	‡336	4,624,483

*Incl. 38 distillate. ‡Incl. 1 service.

TEXAS GULF COAST
(District 2)

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	27	7	4	16	155,287
February	13	3	0	10	88,578
March	32	7	5	20	208,645
April	18	4	2	12	120,094
May	29	5	3	21	169,963
June	27	6	3	18	156,438
July	23	2	4	17	146,922
August	31	5	0	26	199,537
September	24	1	3	20	144,427
October	21	3	1	17	137,549
November	33	3	5	25	193,031
December	21	2	2	17	134,135
Total	299	48	32	219	1,854,606

TEXAS GULF COAST
(District 2)

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Bee	33	5	6	22	177,106
Calhoun	26	9	1	16	215,302
DeWitt	23	5	2	16	184,022
Goliad	44	6	7	31	229,035
Jackson	34	6	4	24	226,211
Karnes	33	2	0	31	185,088
Lavaca	9	0	0	9	76,578
Live Oak	39	5	3	31	199,708
Refugio	25	5	4	16	164,441
Victoria	33	5	5	23	197,115
Total	299	48	32	219	1,854,606

TEXAS GULF COAST
(District 2)

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Berclair	53	38	0	15	160,352
Blanconia	4	1	2	1	20,307
Blanconia, S.	4	2	0	2	21,814
Bonnie View	4	1	0	3	19,889
Brandt	4	3	1	0	31,134
Cabeza Creek	10	5	0	5	60,950
Clayton	7	6	1	0	55,359
Coletto Creek	6	0	4	2	28,979
Cologne	10	0	7	3	47,618
Greta-Deep	7	1	6	0	40,437
Helen Gohlke*	48	46	0	2	398,062
Heyser	6	6	0	0	37,491
Hobson	6	4	0	2	24,404
McFaddin, E.	4	3	0	1	24,267
N. Francitas	6	4	0	2	55,355
N. Runge	6	3	0	3	40,046
Oakville	4	3	1	0	19,977
Placedo	41	38	0	3	198,130
Provident City	5	4	0	1	34,495
Refugio Fox	10	6	0	4	52,653
Russek	4	2	1	1	21,235
Sliva	12	4	5	3	50,192
S. Cottonwood Creek	13	13	0	0	99,945
S. Long Mott	4	1	2	1	32,719
S. Porter	4	3	0	1	16,658
Swan Lake	15	13	0	2	131,108
Tynan	5	3	1	1	22,099
Wajack	7	4	0	3	42,234
W. Fordtran*	5	5	0	0	41,787
W. Ranch	7	6	0	1	43,966
Youngeen	8	3	3	2	30,908
Miscellaneous	147	57	37	53	865,312
Total	476	288	71	117	2,769,882

*These two fields combined.

TEXAS GULF COAST
(District 3)

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	142	91	22	29	860,211
February	99	65	7	27	600,209
March	144	87	7	50	937,325
April	84	63	3	18	549,157
May	165	105	10	50	1,005,404
June	135	71	5	59	836,215
July	131	70	12	49	786,309
August	158	97	15	46	965,293
September	88	67	1	20	556,870
October	127	62	10	55	875,706
November	144	88	7	49	930,505
December	121	65	7	49	799,853
Total	1,538	*931	106	501	9,703,057

*Incl. 46 distillate wells.

TEXAS GULF COAST
(District 3)

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	26	11	3	12	175,268
February	23	4	2	17	158,840
March	41	8	3	30	319,071
April	15	4	2	9	110,252
May	40	5	5	30	315,728
June	39	6	1	32	295,472
July	26	2	1	23	204,093
August	31	2	5	24	232,675
September	23	9	0	14	172,322
October	34	6	3	25	281,612
November	35	6	3	26	275,408
December	30	8	2	20	241,698
Total	363	71	30	262	2,782,439

TEXAS GULF COAST
(District 3)

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Austin	7	3	1	3	69,406
Brazoria	35	0	4	31	290,395
Burleson	2	0	0	2	6,674
Chambers	21	4	0	17	175,547
Colorado	11	5	1	5	111,194
Fayette	13	2	0	11	40,095
Fort Bend	31	6	5	20	213,172
Galveston	7	2	0	5	62,817
Grimes	10	2	0	8	76,833
Hardin	13	4	1	8	97,764
Harris	31	8	1	22	241,953
Jasper	8	2	0	6	67,708
Jefferson	18	7	0	11	156,566
Lee	3	0	0	3	19,517
Liberty	29	7	2	20	240,233
Matagorda	26	3	4	19	208,672
Montgomery	14	1	2	11	110,121
Newton	10	4	1	5	83,158
Orange	12	2	0	10	95,021
Polk	2	0	0	2	10,911
San Jacinto	8	0	0	8	54,106
Tyler	5	1	0	4	44,829
Waller	2	0	0	2	15,382

County—	Comp.	Oil	Gas	Dry	Footage
Washington	6	2	0	4	49,368
Wharton	39	6	8	25	241,077
Total	363	71	30	262	2,782,439

TEXAS GULF COAST
(District 3)
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Anahuac	5	1	1	3	44,449
Angleton	5	1	3	1	51,081
Arcola	8	8	0	0	65,100
Arriola	12	11	1	0	59,677
Barbers Hill	19	14	0	5	81,680
Batson	30	21	0	9	117,211
Big Hill	8	5	0	3	64,573
Blue Ridge	29	20	0	9	92,056
Boling	35	22	0	13	104,801
Cedar Bayou, N.	12	10	0	2	79,581
Chocolate Bayou	7	5	1	1	65,937
Clay Creek	18	8	2	8	47,788
Clinton	5	4	1	0	29,503
Collegeport	9	0	9	0	38,011
Columbus	6	5	1	0	57,202
Damon Mound	14	13	0	1	38,326
Danbury	12	10	0	2	72,031
Dayton, N.	11	7	0	4	50,557
Duffy	4	4	0	0	23,296
Durkee	12	12	0	0	86,847
Dyersdale	4	3	0	1	14,068
Esperson	5	3	1	1	27,119
Fannett	12	10	0	2	81,760
Fisher's Reef	9	4	1	4	80,295
Gillock	9	6	0	3	86,275
Gist (7,200 ft.)	7	3	0	4	52,443
Goose Creek	109	97	0	12	494,187
Gum Bayou	4	1	1	2	41,629
Hamel	6	6	0	0	56,414
Hankamer	18	14	1	3	103,053
Hardin	5	3	0	2	41,663
High Island	13	12	0	1	54,514
Hull	58	52	1	5	443,677
Humble	28	24	0	4	94,713
Hutchins, Kubela	6	2	1	3	28,269
Katy	4	0	3	1	29,846
Markham	11	6	0	5	35,240
Midfields	10	8	0	2	98,210
Moore's Orchard	13	11	1	1	96,019
Moss Bluff	8	6	0	2	48,311
Nash	10	6	0	4	45,068
Neils Carlson	11	10	0	1	72,462
New Ulm	17	13	2	2	179,958
Nona Mills	9	6	0	3	76,150
Old Ocean	7	7	0	0	73,307
Orange	13	12	0	1	54,014
Pickett Ridge	20	17	0	3	97,077
Pierce Junction	17	12	1	4	78,619
Port Netches	5	3	1	1	35,476
Port Neches, N.	4	1	2	1	35,746
Prasifka	4	3	0	1	18,288
Raccoon Bend	7	3	2	2	42,342
Rankin	5	5	0	0	41,886
Rose City	10	9	0	1	76,506
Saratoga	28	23	0	5	79,594
Silsbee	5	4	0	1	37,415
Sour Lake	54	42	0	12	208,659
S. Dayton	21	20	0	1	174,815
S. Gillock	12	9	1	2	112,790
S. Houston	4	4	0	0	20,202
S. Liberty	29	24	0	5	136,259
SW. Muldoon	5	5	0	0	11,723
Spanish Camp	11	0	11	0	36,589
Spindletop	14	7	0	7	82,035
Stratton Ridge	5	1	0	4	26,493
Trinity Bay	5	5	0	0	43,145
Turtle Bay	4	2	0	2	30,386
Village Mills, E.	45	42	2	1	305,721
W. Beaumont	20	15	4	1	121,643
W. Columbia	5	3	0	2	24,627
W. Orange	6	5	0	1	34,428
Miscellaneous	163	90	21	52	1,230,093
Total	1,175	860	76	239	6,920,618

SOUTHWEST TEXAS
(District 4)
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	139	95	7	37	636,908
February	102	67	4	31	539,279
March	172	94	8	70	887,999
April	122	72	6	44	573,821
May	154	87	13	54	807,819
June	122	70	11	41	611,035
July	175	87	15	73	782,851
August	189	95	15	79	973,577
September	129	64	8	57	613,293
October	113	60	6	47	561,361
November	155	75	10	70	843,405
December	136	86	5	45	710,185
Total	1,708	*952	108	†648	8,541,535

*Incl. 43 distillate. †Incl. 7 service.

SOUTHWEST TEXAS
(District 4)
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	25	3	1	21	125,175
February	23	4	1	18	113,789
March	48	10	3	35	287,015
April	28	4	0	24	142,571
May	42	12	1	29	232,691
June	32	4	4	24	169,865
July	61	6	9	46	301,451
August	58	10	3	45	292,222
September	38	3	5	30	212,540
October	28	1	1	26	130,137
November	59	9	4	46	360,553
December	39	6	2	31	205,622
Total	481	72	34	375	2,553,631

SOUTHWEST TEXAS
(District 4)
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Aransas	15	6	2	7	137,478
Brooks	12	4	0	8	70,351
Cameron	3	0	0	3	35,460
Duval	79	5	5	69	318,799
Hidalgo	19	6	4	9	169,950
Jim Hogg	63	5	1	57	250,136
Jim Wells	36	4	3	29	179,242
Kenedy	6	1	1	4	54,351
Kleberg	2	1	0	1	15,792
Nueces	56	11	9	36	426,616
San Patricio	56	18	3	35	439,955
Starr	54	9	5	40	189,143
Webb	44	1	0	43	148,361
Willacy	2	0	0	2	16,036
Zapata	34	1	1	32	101,967
Total	481	72	34	375	2,553,631

SOUTHWEST TEXAS
(District 4)
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Agua Dulce	12	7	3	2	75,311
Amargosa	7	4	2	1	45,615
Billings	33	25	0	8	82,207
Bishop, W.	4	1	2	1	31,095
Borregas	4	4	0	0	28,367
Charamousca, N.	12	8	0	4	19,812
Cinco De Mayo	4	0	1	3	10,977
Colmena	29	27	0	2	41,399
Corpus Christi	10	6	0	4	69,462
D.C.R. 79	12	10	0	2	18,666
Donna	5	2	0	3	43,960
Eagle Hill	5	2	1	2	30,775
Ed Lasater	7	4	0	3	16,608
El Ebanite	6	1	0	5	28,142
El Mesquite	5	0	0	5	15,997
Flour Bluff, E.	10	8	0	2	70,637
Fulton Beach	22	20	0	2	160,323
Fulton Beach, W.	6	6	0	0	47,478
Garcia	15	13	0	2	63,378
Government Wells, N.	24	17	0	7	58,538
Gregg Wood	4	0	1	3	7,448
Gruy	15	12	0	3	41,140
Hagist Ranch	12	8	2	2	94,091
Hardwicke	12	7	2	3	53,172
Harvey	6	4	0	2	56,913
Hellen	5	3	0	2	15,317
Hoffman	61	54	0	7	138,560
Hollow Tree	16	12	0	4	59,043
Jay Simmons	7	5	0	2	46,512
Jones, E.	38	29	0	9	178,461
Jones, NE.	4	0	0	4	21,037
Kelsey, Deep	20	19	0	1	130,384
Kohler	4	3	0	1	12,092
La Gloria	7	6	1	0	53,522
La Reforma	10	3	0	7	71,432
Lopez, N.	9	7	0	2	19,043
Lou Ella	19	17	2	0	97,199
Lundell	18	17	1	0	44,958
McAllen	7	5	1	1	69,320
Magnolia City	4	2	1	1	23,410
Magnolia City, N.	4	2	1	1	21,870
Marks	29	27	0	2	62,322
Midway-Holst	4	2	2	0	25,167
Moca	7	2	1	4	17,130
Mustang Island	47	44	3	0	372,198
Nueces Bay	5	0	3	2	23,180
Nueces Bay, W.	8	4	3	1	67,646
Odem	4	1	3	0	13,505
Palo Blanco	27	22	2	3	131,375
Piedre Lumbre	5	1	0	4	9,720
Plymouth	38	38	0	0	224,904
Poquito Creek	5	2	0	3	12,760
Portilla	15	14	0	1	134,943
Premont	25	24	0	1	105,190
Rachal	13	9	0	4	66,572
Red Fish Bay	7	7	0	0	58,039
Ricaby	16	13	1	2	25,918
Rincon-Vicksburg	31	13	0	18	176,275
Riverside "B"	8	7	1	0	44,598
Riverside, E.	14	10	1	3	75,876
Salt Lake	5	4	1	0	41,711
Sarita	5	5	0	0	38,341
Seeligson	39	36	0	3	257,817
South Seventy-Six	30	22	3	5	56,600
Sinton-Deep, N.	16	11	2	3	94,856
Sinton, W.	39	33	5	1	173,450
Stratton	15	13	0	2	104,192
Taft	10	9	0	1	43,508
Taft, W.	9	6	0	3	44,326
Tal Vez	9	6	0	3	21,381
Tijerina-Canales-Blucher	5	4	1	0	39,218
Welder-Durham	5	5	0	0	24,840
White Point, E.	8	4	2	2	57,641
Willamar	21	14	0	7	168,128
Yeager, N.	10	10	0	0	31,107
Miscellaneous	179	78	19	82	929,599
Total	1,227	880	74	273	5,987,904

EAST TEXAS
(Districts 5 and 6)
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	103	75	1	27	492,414
February	70	44	4	22	273,927
March	100	66	0	34	451,249
April	105	71	1	33	442,692
May	112	66	2	44	523,498
June	117	78	3	36	506,099
July	100	73	1	26	447,868
August	124	69	2	53	609,657
September	93	62	1	30	480,303
October	86	53	4	29	452,939
November	86	41	8	37	449,859
December	78	41	3	34	472,107
Total	1,174	*739	30	†405	5,602,632

*Incl. 79 distillate. †Incl. 1 service.

EAST TEXAS
(Districts 5 and 6)
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	14	0	0	14	68,173
February	15	0	0	15	47,949
March	22	0	0	22	98,972
April	22	4	0	18	87,056
May	29	4	0	25	133,984
June	16	0	0	16	52,761
July	20	2	0	18	88,347
August	39	4	0	35	182,381
September	20	4	0	16	92,866
October	15	1	2	12	78,379
November	22	0	0	22	122,401
December	21	1	0	20	122,579
Total	255	20	2	233	1,175,848

EAST TEXAS
(Districts 5 and 6)
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Anderson	12	3	0	9	72,287
Bowie	4	0	0	4	27,009
Cherokee	10	1	0	9	49,197

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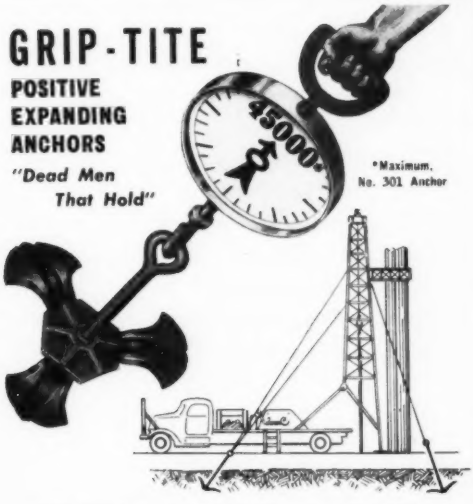

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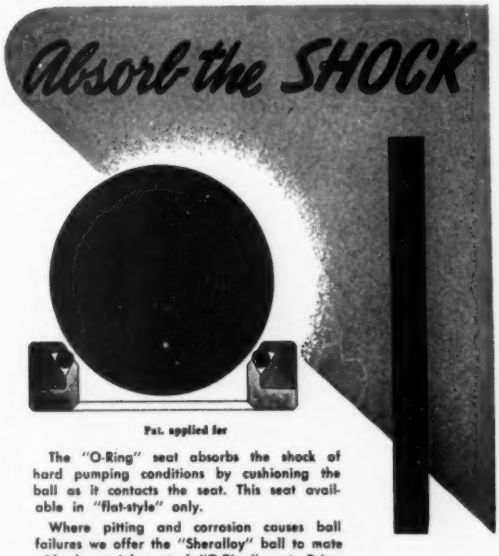

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Where pitting and corrosion causes ball failures we offer the "Sheralloy" ball to mate with the stainless steel "O-Ring" seat. Prices for this combination furnished on request.

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5. **Chamfered inside edges.**
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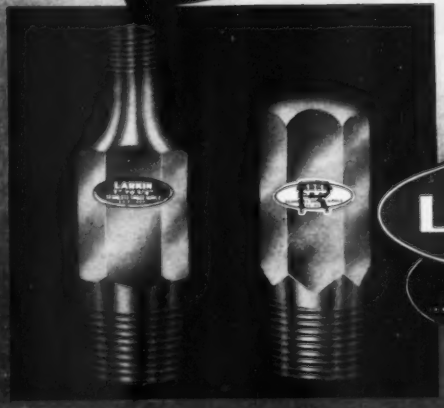

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PACKER COMPANY, INC.
ST. LOUIS, MO.

County—	Comp.	Oil	Gas	Dry	Footage
Collins	1	0	0	1	2,750
Ellis	2	0	0	2	5,813
Falls	45	0	0	45	68,540
Fannin	4	0	0	4	11,849
Freestone	2	0	0	2	18,890
Grayson	18	5	0	13	109,062
Harrison	4	0	1	3	28,300
Henderson	5	0	0	5	25,537
Hill	4	0	0	4	5,543
Hopkins	2	0	0	2	12,208
Houston	6	1	0	5	36,201
Hunt	6	0	0	6	20,998
Kaufman	6	0	0	6	35,605
Lamar	2	0	0	2	8,666
Leon	3	1	0	2	26,245
Limestone	7	1	0	6	31,916
Marion	7	1	0	6	37,544
McLennan	8	0	0	8	10,528
Morris	4	0	0	4	22,311
Nacogdoches	2	0	1	1	17,706
Navarro	11	0	0	11	38,938
Rains	5	1	0	4	30,869
Red River	4	0	0	4	7,798
Robertson	5	0	0	5	14,344
Rusk	5	1	0	4	29,802
Shelby	5	1	0	4	26,041
Smith	5	0	0	5	24,306
Titus	4	0	0	4	27,205
Upshur	3	0	0	3	33,615
Van Zandt	6	0	0	6	38,100
Wood	33	4	0	29	193,482
Miscellaneous	5	0	0	5	26,563
Total	255	20	2	233	1,175,848

EAST TEXAS
(Districts 5 and 6)
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Alba	3	2	0	1	14,904
Bolivar, S. & NW.	23	17	0	6	37,021
Buffalo	19	14	2	3	115,370
Calvert	4	0	2	2	17,481
Carthage	23	10	7	6	145,891
Cayuga	5	3	1	1	23,636
Chapel Hill	5	4	1	0	39,679
Cow Bayou	13	5	0	8	14,786
Deer Creek	31	14	0	17	34,885
Deupree	4	3	0	1	23,901
Earl Lee	4	3	0	1	23,103
East Texas field	222	216	0	6	824,242
Forest Hill	11	11	0	0	50,205
Ham Gossett	29	24	0	5	142,506
Jacksonville, N.	24	18	2	4	111,374
Joaquin	3	1	0	2	18,830
Long Lake	3	3	0	0	15,892
Lott	35	17	0	18	45,732
Lott, S.	8	4	0	4	10,489
Midway Lake	26	23	0	3	121,992
North Landing	9	5	1	3	64,396
Opelika	9	7	2	0	82,857
Pewitt Ranch	59	54	0	5	270,014
Pickton	32	32	0	0	253,283
Pickton, SE.	24	22	0	2	190,088
Pilot Point	3	3	0	0	4,677
Pine Mills	31	29	0	2	171,069
Quitman	9	7	0	2	38,482
Red Springs	5	5	0	0	47,991
Sandusky	33	30	0	3	245,309
Sherman & E.	16	13	0	3	66,647
Shirley Barbara	4	3	0	1	23,103
Stegall	5	0	0	5	19,108
Tennessee Colony	30	27	0	3	291,378
Trawick	9	5	3	1	73,201
Walter Fair	11	6	0	5	57,012
Wash-Tex	11	2	0	9	11,858
Waskom	45	31	5	9	279,342
William Wise	2	0	0	2	10,273
Woodlawn	15	12	1	2	100,739
Unnamed	4	1	0	3	30,373
Miscellaneous	58	33	1	24	273,060
Total	919	719	28	172	4,426,784

WEST CENTRAL DISTRICT
(District 7-B)
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	166	93	0	73	525,650
February	134	69	1	64	403,418
March	199	88	7	104	664,214
April	187	93	3	91	619,437
May	220	85	5	130	656,455
June	201	84	1	116	628,033
July	176	77	2	97	576,170
August	263	109	4	150	888,106
September	194	85	2	107	627,989
October	173	76	2	95	613,953
November	243	112	3	128	812,653
December	170	75	9	86	569,033
Total	2,326	1,046	39	*1,241	7,585,111

*Includes 3 service wells.

WEST CENTRAL DISTRICT
(District 7-B)
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	54	14	0	40	197,100
February	44	7	0	37	136,960
March	81	13	3	65	287,966
April	83	20	2	61	299,613
May	102	19	1	82	331,255
June	81	14	0	67	246,358
July	77	12	1	64	248,712
August	121	20	2	99	400,842
September	96	15	1	80	310,333
October	84	17	1	66	306,365
November	116	27	2	87	378,200
December	80	15	3	62	302,628
Total	1,019	193	16	810	3,446,332

WEST CENTRAL DISTRICT
(District 7-B)
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Brown	44	4	0	40	64,019
Callahan	65	14	0	51	180,206
Coleman	116	11	4	101	325,155
Comanche	14	0	1	13	38,803
Eastland	84	28	3	53	257,468
Erath	2	0	0	2	4,362
Fisher	41	8	1	32	237,788
Hamilton	1	0	0	1	3,480
Haskell	59	14	0	45	293,515
Hood	1	0	0	1	5,448
Jones	153	26	0	127	502,867
Lampasas	2	0	0	2	5,398
Mills	3	0	0	3	3,596
Nolan	19	4	0	15	123,573
Palo Pinto	39	4	1	34	93,206
Parker	16	2	2	12	61,187
Shackelford	90	13	0	77	194,349
Stephens	104	22	4	78	293,239
Stonewall	60	17	0	43	337,821
Taylor	57	8	0	49	230,845
Throckmorton	49	18	0	31	189,917
Total	1,019	193	16	810	3,446,332

WEST CENTRAL DISTRICT
(District 7-B)
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Albany, SE.	4	2	0	2	17,566
Amy Sears-King	5	5	0	0	15,860
Anzac-Morris	3	1	0	2	7,281
Aspermont	5	3	0	2	28,206
Aspermont, S.	6	4	0	2	30,528
Eall-Kuehn	9	7	0	2	43,856
Bankline-Owen	43	33	0	10	157,997
Bankline-Owen, North	5	3	0	2	17,464
Bartlett & E.	36	30	0	6	111,537
Bessie	4	3	0	1	17,965
Big Sandy	3	3	0	0	11,579
Blair	15	13	0	2	43,620
Blair, Shallow	3	0	0	3	8,684
Brooksmith	4	4	0	0	4,169
Brown	34	24	0	10	49,204
Bullard	45	39	0	6	116,772
Callahan	7	2	0	5	16,671
Carlisle	3	1	0	2	16,778
Cisco	3	0	0	3	11,056
Coleman Junction	3	1	0	2	6,705
Coleman Junction, N.	8	3	0	5	17,033
Coleman	32	20	1	11	67,325
Conway	3	1	0	2	4,740
Cook Ranch	8	2	0	6	11,409
Courtney	5	3	0	2	11,344
Crow-Swastika	4	2	0	2	13,658
Denton	3	0	0	3	4,032
Desdemona	3	0	0	3	8,768
Double Mountain	15	10	0	5	83,613
Eastland	16	6	0	10	39,158
East Hamlin	34	24	0	10	103,866
Effie Anderson	3	0	0	3	8,700
Flat Top	3	0	0	3	9,519
Flowers	14	14	0	0	64,125
Frankirk-Ellenburger	13	12	0	1	78,739
G. B. Caddo	3	3	0	0	12,362
Glen Cove	13	10	0	3	44,370
Guest	5	4	0	1	24,465
Haskell	3	0	0	3	14,176
Hatchett	8	6	0	2	16,978
Herron	4	3	0	1	19,519
Hubbard Creek	6	5	0	1	24,712
Ibex	3	1	0	2	9,990
Jackson	35	30	1	4	62,898
Jones	74	50	1	23	186,737
Kadane-Beaumont	7	5	0	2	11,756
Katz	36	36	0	0	183,633
Kiowa Peak	5	3	0	2	27,503
Kleiner	3	1	0	2	11,115
Lake Trammell	8	3	0	5	45,958
Lawn, SW.	7	6	0	1	28,722
Lloyd-Dalton	3	2	0	1	5,364
Leuders-Hope, West	4	2	0	2	7,818
McWilliams-Davis	7	6	0	1	25,463
Matilda Perkins	4	3	0	1	6,620
Mead	4	1	0	3	19,809
Mesquite	3	3	0	0	9,165
Metcalf Gap	5	4	0	1	6,389
Morrissett-Tannehill	11	10	0	1	17,823
Moutray-Moore	3	0	0	3	12,995
Mudge-Sloan	3	2	0	1	13,523
Noodle, S.	4	3	0	1	12,306
Ogden-Mabee	9	3	0	6	26,346
Old Glory	30	28	0	2	175,614
Palo Pinto	23	13	1	9	36,427
Pardue-Ellenburger	15	15	0	0	85,043
Pardue-Swastika	18	17	0	1	70,949
Putnam, S.	3	1	1	1	12,266
Rallen	4	3	0	1	14,147
Roby, SE.	3	1	0	2	11,589
Round Top	26	17	0	9	126,264
Salt Prong	3	1	1	1	5,938
Santa Anna & S.	61	29	4	28	112,684
Santa Anna Gas	5	2	3	0	10,351
Saxon Guion	3	3	0	0	12,894
Shackelford	54	31	1	22	70,243
Sojourner	15	14	0	1	79,593
Springtown	4	4	0	0	15,807
Stamford & W.	4	2	0	2	9,108
Stanley	7	2	0	5	33,073
Stephen City	3	3	0	0	6,568
Stephens	24	13	1	10	64,892
Stephens-Shankle	6	5	0	1	10,002
Sunshine	4	3	0	1	7,817
Swenson Ranch-Caddo	3	2	0	1	15,910
Taylor	5	2	0	3	16,722
Templeton-Jennings	6	4	0	2	21,642
Throckmorton	26	14	0	12	85,517
Toler	5	4	0	1	19,083
Toombs	3	2	0	1	8,879
Weinert	9	7	0	2	44,108
Windham-Tannehill	19	13	0	6	23,018
Woodson, NE.	3	2	0	1	10,241
Unnamed	16	11	0	5	61,566
Miscellaneous	213	105	8	100	713,380
Total	1,307	853	23	431	4,138,779

WEST TEXAS
(Districts 8 and 7-C)
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	370	294	0	76	2,008,565
February	348	268	0	80	1,902,758
March	463	357	1	105	2,519,418
April	303	304	1	88	2,079,789
May	492	389	3	100	2,630,860
June	385	312	0	73	2,068,300
July	396	302	2	92	2,159,049
August	506	405	3	98	2,829,388
September	413	332	3	78	2,345,294
October	409	334	4	71	2,296,251
November	463	372	2	89	2,660,019
December	475	384	6	85	2,733,634
Total	5,113	*4,053	25	†1,035	28,233,325

*Incl. 34 distillate. †Incl. 1 service.

WEST TEXAS
(Districts 8 and 7-C)
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	45	9	0	36	272,406
February	64	13	0	51	415,888
March	74	14	0	60	458,389
April	59	10	1	48	366,724
May	94	26	3	65	591,205
June	58	15	0	43	354,619
July	75	16	1	58	519,104
August	91	24	1	66	587,197
September	73	19	0	54	462,257
October	63	15	1	47	406,919
November	79	18	1	60	450,782
December	69	10	1	58	442,230
Total	844	189	9	646	5,327,720

WEST TEXAS
(Districts 8 and 7-C)
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Andrews	23	9	0	14	176,261
Bailey	2	0	0	2	17,295
Borden	21	6	0	15	167,575
Cochran	5	3	0	2	29,675
Coke	31	4	0	27	188,261
Concho	24	1	0	23	74,919
Cottle	6	0	0	6	43,573
Crane	20	6	0	14	113,420
Crockett	56	9	1	46	240,500
Crosby	4	0	0	4	34,217
Culberson	3	0	0	3	7,145
Dawson	20	7	0	13	187,752
Dickens	6	0	0	6	43,785
Ector	13	4	0	9	107,423
Gaines	18	3	0	15	141,258
Garza	22	2	0	20	119,604
Glasscock	19	11	0	8	138,448
Hale	5	0	0	5	37,994
Hockley	8	0	0	8	82,771
Howard	34	2	0	32	248,783
Hudspeth	2	0	0	2	1,884
Irion	9	3	0	6	58,735
Jeff Davis	2	0	0	2	19,985
Kent	15	2	0	13	104,661
Kimble	9	1	0	8	18,240
King	11	1	0	10	63,308
Loving	6	1	0	5	54,862
Lubbock	9	0	0	9	98,358
Lynn	11	0	0	11	95,978
Martin	17	3	0	14	156,850
Menard	3	0	0	3	6,856
Midland	36	23	0	13	363,943
Mitchell	10	2	0	8	68,214
Pecos	59	9	2	48	209,086
Reagan	37	19	0	18	248,140
Reeves	8	1	0	7	43,146
Runnels	87	14	3	70	379,396
Schleicher	32	5	0	27	171,612
Scurry	17	3	0	14	109,603
Sterling	10	1	0	9	35,700
Sutton	11	2	3	6	59,937
Terry	17	0	0	17	177,490
Tom Green	34	5	0	29	179,930
Upton	32	24	0	8	251,520
Ward	2	1	0	1	7,319
Winkler	7	1	0	6	63,705
Yoakum	6	1	0	5	48,170
Miscellaneous	5	0	0	5	30,433
Total	844	189	9	646	5,327,720

WEST TEXAS
(Districts 8 and 7-C)
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Abell area	27	22	0	5	137,044
Adair	32	30	0	2	272,079
Aldwell-Sprayberry	4	4	0	0	28,911
Andector-Ellenburger	13	13	0	0	111,915
Anton-Irish	14	14	0	0	85,924
Anton, W.	7	7	0	0	46,370
Beddo & N.	13	9	0	4	38,011
Benedum	34	30	1	3	283,883
Betty	6	3	0	3	7,830
Bronte	13	11	0	2	60,273
Brown-Cisco	8	8	0	0	50,034
Brownsfield, S.	8	5	0	3	85,030
Brushy Top	4	2	0	2	4,375
Burt-Gardner	11	6	0	5	37,695
C-Bar	7	7	0	0	25,758
Cedar Lake	24	22	0	2	113,032
Clairemont	6	5	0	1	40,991
Clara Couch	5	3	0	2	10,945
Clark	11	9	0	2	11,976
Cobb-6,700	6	4	0	2	40,767
Cogdell	125	121	0	4	875,142
Cogdell-Fuller	12	12	0	0	63,693
Cordona Lake	7	7	0	0	39,132
Crandall	4	0	0	4	5,983
Cree-Sykes	69	66	1	2	278,305
Crockett	5	4	0	1	7,339
Davis	4	2	0	2	16,223
Diamond M*	101	95	0	6	610,901
Dixieland	5	4	0	1	23,425
Dollarhide & E.	51	50	0	1	379,229
Donnelly	21	17	0	4	92,354
Dorward	43	43	0	0	108,752
Doss	6	6	0	0	54,681
Driver	126	124	0	2	889,696
Durham	6	5	0	1	10,267
Elkhorn	4	4	0	0	28,861
Elm Creek	9	8	0	1	41,300
Emperor-Holt	9	8	0	1	43,589
Ft. Chadbourne	127	117	0	10	684,926
Ft. Chadbourne, W.	11	11	0	0	59,133
Fort Stockton	22	21	0	1	64,256
Freeman	7	4	0	3	28,194
Fuhrman	11	11	0	0	50,092
Fullerton & S.	16	15	0	1	118,618
Garza	43	39	0	4	135,819
Germania	48	46	0	2	347,731
George Parks-Cisco	4	4	0	0	24,610
Goldsmith & N.	273	270	0	3	1,654,639
Good	14	12	0	2	115,326
Harriett	5	3	0	2	23,909
Harris	9	8	0	1	48,011
Hobo	6	6	0	0	42,736
Howard-Glasscock	37	34	0	3	78,820
Hulldale area	29	27	0	2	168,040
Hull-Dobbs	9	9	0	0	37,205
Hurdle	9	8	0	1	48,453
Iatan-East Howard	14	13	0	1	39,803
Jameson	36	34	0	2	231,104
Jim Adams	17	11	0	6	76,801
Jordan	32	29	0	3	226,013

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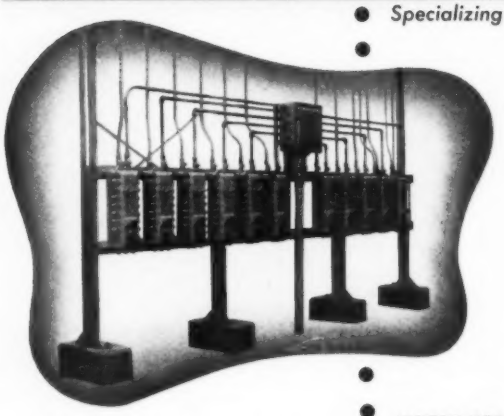
Specializing in Electrical Equipment for the Oil Industry



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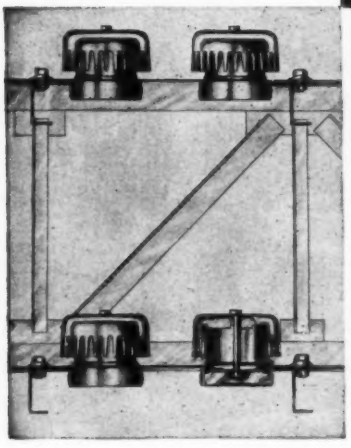

NEW CAP ASSEMBLIES—New design makes possible quick, easy removal by one man, working from top side. Flush tray surface, without flanges and projecting edges around holes, makes cleaning faster and easier.

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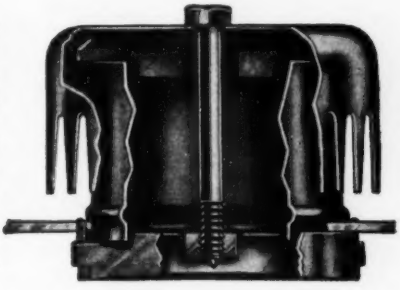
One truss for every two trays when long spans are necessary . . . with every alternate tray level free of major supports. Gilbarco Duo-Level Alloy Bubble Trays are faster to install, far easier of access, more rigid with lighter weight.



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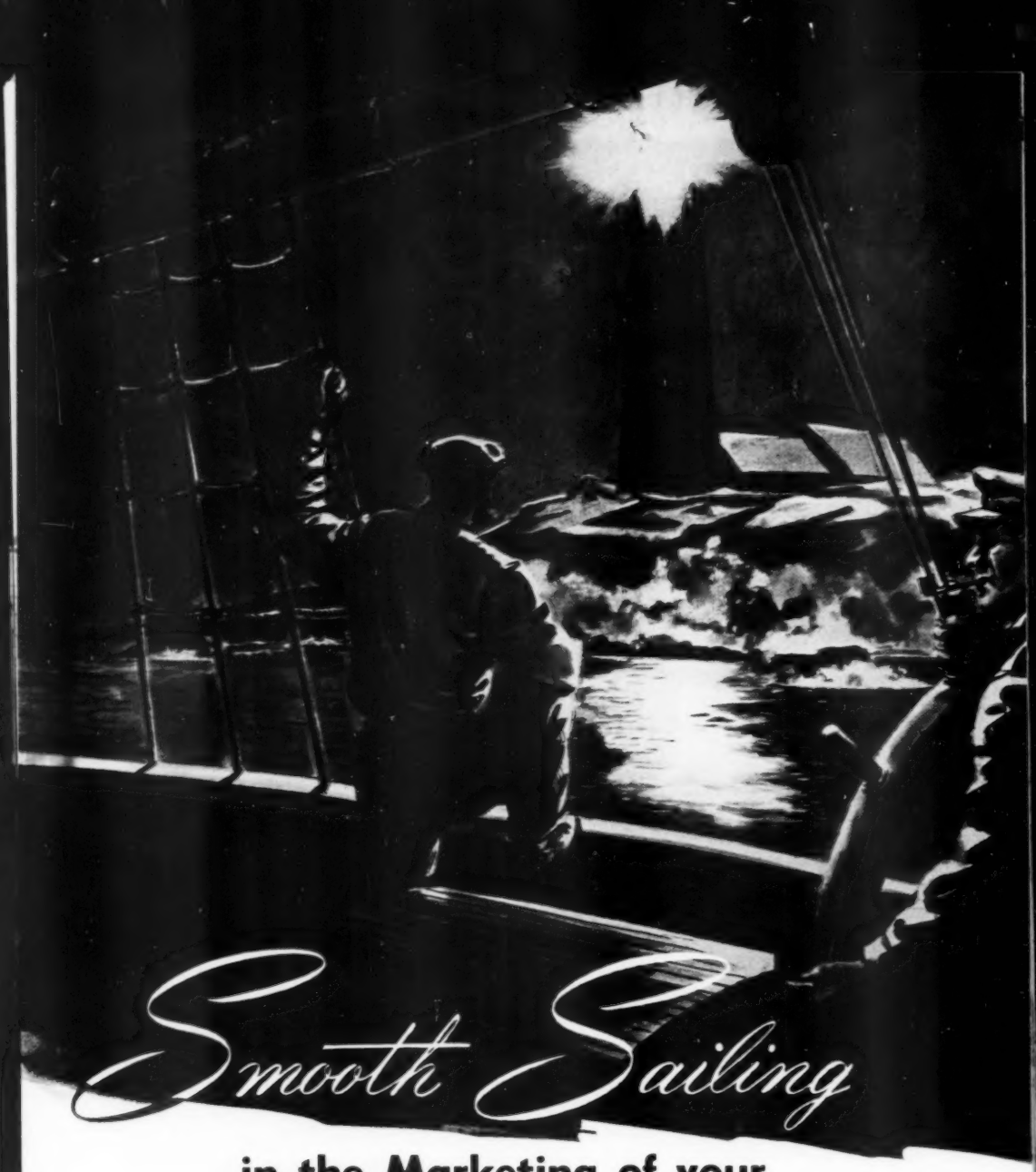

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MARKETERS OF NATURAL GASOLINE, BUTANE-PROPANE, MOTOR FUEL, FUEL OILS

Field—	Comp.	Oil	Gas	Dry	Footage
Kelly-Snyder & N.	90	82	0	8	624,152
Kermit	6	5	1	0	18,776
Keystone & SE.	18	18	0	0	121,643
Lawson-Simpson	15	14	0	1	86,401
Lehn-Apco, & N.	7	5	0	2	13,192
Levelland	183	179	0	4	909,151
Lloyd	5	4	0	1	23,053
Love	3	2	0	1	7,402
Malicky	42	37	0	5	85,399
McCamey	28	20	0	8	68,143
McCamey-Elenburger	7	6	0	1	23,146
McCutchen-Cisco	9	5	0	4	36,230
McElroy	22	21	0	1	67,725
McKee	4	4	0	0	16,643
Means	20	19	0	1	90,603
Midkiff	27	27	0	0	197,049
Midland Farms	116	111	0	5	558,450
Midway Lane	8	6	0	2	10,077
Millican	15	13	0	2	97,831
North Cowden	11	11	0	0	51,482
North Snyder, Strawn	9	6	0	3	68,235
North Russell, Devonian	4	4	0	0	44,689
North Riley	5	4	0	1	41,593
Nora Gardner	22	20	0	2	88,762
Olson	11	9	0	2	16,343
Parks-Cisco	20	20	0	0	182,865
Patsy	5	2	0	3	16,183
Peck	16	16	0	0	195,102
Pecos Valley	32	28	1	3	59,004
Pegasus	36	36	0	0	449,731
Pembrook	57	57	0	0	366,276
Pembrook, N.	34	34	0	0	243,379
Pfluger	5	1	0	4	10,411
Polar, E. & N.	8	6	0	2	60,427
Reinecke	29	23	0	6	214,864
Robertson	4	3	0	1	28,944
Rocker "A"	27	25	0	2	67,360
Ropes	9	6	0	3	82,778
Salt Creek	44	40	0	4	281,729
Sand Hills & W.	33	31	0	2	133,079
Saxon-Serrat	4	3	0	1	8,286
Seminole	8	8	0	0	50,871
Seminole, W.	12	12	0	0	61,673
Sharon Ridge	86	84	0	2	579,856
Sharon Ridge-Clear Fork	8	8	0	0	25,610
Sharon Ridge, Shallow	64	60	0	4	115,975
Slaughter	78	77	0	1	383,059
South Cowden	15	13	0	2	57,505
South Ward	34	29	0	5	84,517
Spraberry, Deep	7	7	0	0	47,594
Susan Peak & S.	16	8	3	5	78,599
Sykes-Morris	14	10	1	3	23,444
Taylor-Link	9	7	0	2	13,463
Tex-Harvey	322	320	0	2	2,314,947
Tippett	9	7	0	2	63,958
Toborg	149	122	0	27	72,132
Tunstill	30	28	0	2	105,137
TXL	34	34	0	0	216,748
Vaughn	96	90	0	6	138,640
Vealmoor & N.	15	10	0	5	119,830
Vealmoor, E.	49	47	0	2	361,065
Von Roeder	30	25	0	5	204,464
Walker	5	5	0	0	12,463
Wasson	21	21	0	0	108,079
Water Valley	43	32	0	11	49,602
Weddell-Spraberry	4	4	0	0	28,790
Weiner-Floyd	33	33	0	0	231,510
Welch	5	4	0	1	31,535
Wellman	16	15	0	1	161,120
Wheat	18	14	0	4	78,835
Wilshire-Ellenburger	8	8	0	0	99,594
Winters area	18	14	0	4	74,208
World	22	20	0	2	66,289
Wyatt & S.	6	2	0	4	9,096
Yarbrough and Allen	17	15	0	2	177,936
Yates	5	4	0	1	6,038
Unnamed	12	10	0	2	64,001
Miscellaneous	262	172	8	82	1,450,103
Total	4,269	3,864	16	389	22,905,605

*Diamond M and Sharon Ridge Canyon fields combined by Texas Railroad Commission. 1951 completions by separate fields.

NORTH CENTRAL TEXAS
(District 9)
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	208	112	0	96	634,990
February	200	106	0	94	570,580
March	240	130	2	108	711,080
April	221	95	2	124	690,958
May	300	155	2	143	936,290
June	219	120	2	97	731,881
July	198	83	0	115	630,509
August	259	130	0	129	777,269
September	187	103	0	84	623,162
October	188	115	0	73	632,458
November	280	129	3	148	859,344
December	191	100	0	91	633,356
Total	2,691	*1,378	11	†1,302	8,431,877

*Incl. 2 distillate. †Incl. 24 service.

NORTH CENTRAL TEXAS
(District 9)
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	52	8	0	44	188,573
February	52	11	0	41	170,363
March	64	18	0	46	238,215
April	80	13	0	67	261,814
May	109	25	2	82	323,480
June	70	14	0	56	252,939
July	72	16	0	56	225,384
August	78	15	0	63	254,569
September	55	11	0	44	193,963
October	59	17	0	42	221,709
November	103	17	2	84	334,299
December	68	13	0	55	225,883
Total	862	178	4	680	2,891,171

NORTH CENTRAL TEXAS
(District 9)
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Archer	165	32	0	133	448,207
Baylor	26	5	0	21	110,567
Clay	83	17	0	66	299,023
Cooke	100	14	0	86	266,953

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Typical of all Sivalls separators, emulsion treaters and heaters, Sivalls low pressure horizontal type separator incorporates special design and construction features such as:
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Horizontal movement of oil and gas in same direction.
Accumulator compartment separate from main shell—
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There's a Sivalls Separator to fit your needs!
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County--	Comp.	Oil	Gas	Dry	Footage
Denton	14	1	0	13	36,654
Foard	11	1	0	10	63,606
Hardeman	1	0	0	1	6,005
Jack	116	33	4	79	489,281
Knox	11	1	0	10	65,839
Montague	58	12	0	46	262,245
Wichita	56	10	0	46	143,796
Wilbarger	57	11	0	46	155,229
Wise	19	9	0	10	86,321
Young	145	32	0	113	457,445
Total	862	178	4	680	2,891,171

NORTH CENTRAL TEXAS
(District 9)

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Airport	6	6	0	0	23,302
Allison	5	5	0	0	21,427
An-Son-Conglomerate	5	4	0	1	31,699
Archer	45	32	0	13	91,911
Archer Regular	143	76	0	67	259,713
Barrett	7	7	0	0	44,617
Boedecker	8	6	0	2	48,665
Bowers & S.	3	1	0	2	10,958
Bowie	5	2	0	3	34,407
Bryson & S.	3	3	0	0	11,973
Bunting	3	2	0	1	13,280
Burk-Clara	4	3	0	1	6,577
Burkburnett	34	18	0	16	56,988
Burns-Jones	10	5	0	5	31,612
Burns-Jones, S.	3	2	0	1	9,493
Burns-Ragland	3	3	0	0	9,555
Clara	5	4	0	1	7,338
Clay Regular	28	12	0	16	42,262
Cooke	13	10	0	3	22,791
Cooke Regular	52	35	0	17	83,584
Cynthia	11	7	0	4	45,134
Daly	3	2	0	1	12,128
Darden	7	7	0	0	10,105
DeMoss	7	3	0	4	25,023
Dove	7	6	0	1	22,500
Earl Wisdom	5	3	0	2	8,673
Electra	20	12	0	8	22,653
Electra, S.	10	6	0	4	11,110
Ellis	5	4	0	1	2,700
Era-Ellenburger	4	2	0	2	5,492
Freeport	3	1	0	2	16,587
Garvey-Strawn	35	22	0	13	125,088
Halsell	3	2	0	1	13,507
Hammon-Ellenburger	10	10	0	0	47,131
Hazelton-Strawn	4	1	0	3	14,777
Heard-Ellenburger	5	4	0	1	32,839
Hoefle	4	3	0	1	18,198
Holliday & E. & SW.	5	2	0	3	19,241
Hull-Silk	3	3	0	0	12,007
Hundley	16	13	0	3	100,494
Jack Regular	24	5	0	19	51,070
John Kay	25	22	0	3	66,025
Joy	10	6	0	4	45,770
Jupiter	5	3	1	1	28,315
KMA	15	9	0	6	52,765
Kamay	4	1	0	3	11,734
Kempner	14	10	0	4	52,805
Kennedy-Caddo	9	9	0	0	59,081
Kimbell-Sims	9	7	0	2	32,566
Knox City	22	19	0	3	97,989
Lacy Armour	3	3	0	0	13,706
Langston-Kleiner	20	17	0	3	72,170
Larimore	4	1	0	3	2,753
Lazy B	7	7	0	0	32,362
Lewis-Stuart	3	3	0	0	19,020
Lone Prairie	6	4	0	2	36,334
Lytle-Conglomerate	3	1	0	2	16,408
Maguire	3	1	0	2	15,240
Medders-Strawn	3	2	0	1	13,344
Megargel-Strawn	5	4	0	1	20,410
Montague	3	3	0	0	4,169
Montague Regular	28	11	0	27	72,343
Muenster	5	3	0	2	5,192
Muenster, N.	5	5	0	0	7,464
Newport	3	2	0	1	12,619
North Chalk Hill	4	4	0	0	15,824
North Texas	7	4	0	3	11,195
Oldham	7	5	0	2	7,287
Old Petrolia	7	2	0	5	13,251
Olney area	6	2	0	4	24,105
Peel-Caddo	8	8	0	0	32,974
Petrolia	8	1	0	7	14,559
Prideaux-Strawn	33	31	0	2	112,057
Reno-Strawn	24	18	0	6	91,922
Reno, E.	11	10	0	1	43,468
Richardson-Caddo	25	23	0	2	153,630
Rock Crossing	4	4	0	0	6,242
Rusmag	59	59	0	0	268,735
Spanish Fort	36	25	0	11	75,386
Sturm	5	2	0	3	24,247
Tally-Strawn	3	3	0	0	13,304
Taylor	4	4	0	0	14,190
Texas AM	9	7	0	2	25,065
Vernon & S.	6	1	0	5	12,464
Vogtsberger	8	5	0	3	38,969
Vogtsberger, S.	51	42	0	9	249,798
Waggoner	3	3	0	0	7,362
Walnut Bend	28	27	0	1	133,594
Ward-McCullough	16	13	0	3	58,304
West Jean	7	7	0	0	22,013
Wichita	34	18	0	16	48,777
Wichita Regular	147	88	0	59	250,706
Wichita, S.	6	3	0	3	7,579
Wilbarger Regular	54	38	0	16	103,966
Wolfe	12	7	0	5	42,935
Worsham-Steed	32	30	1	1	150,521
Young	8	5	0	3	17,089
Young, N., S., & SW	8	4	0	4	11,671
Young Regular	73	27	0	46	148,468
Unnamed	28	12	0	16	110,615
Miscellaneous	258	151	5	102	909,255
Total	1,829	1,200	7	622	5,540,706

TEXAS PANHANDLE
(District 10)

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	60	45	8	7	194,622
February	66	30	34	2	197,945
March	53	24	25	4	159,042
April	49	27	11	11	148,284
May	65	32	25	8	201,940
June	47	25	19	3	144,353
July	47	26	13	8	155,397
August	84	32	47	5	259,019
September	51	23	22	6	159,313
October	66	27	28	11	226,167
November	83	32	36	15	282,881
December	58	27	26	5	178,478
Total	729	*350	294	†85	2,307,441

*Incl. 1 distillate. †Incl. 2 service.

TEXAS PANHANDLE
(District 10)

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	0	0	4	23,231
February	1	0	0	1	7,072
March	1	0	0	1	3,881
April	4	0	0	4	18,065
May	1	0	0	1	9,650
June	1	1	0	0	8,540
July	4	1	0	3	26,982
August	2	0	0	2	14,062
September	3	0	0	3	19,797
October	5	0	0	5	37,946
November	7	0	0	7	46,601
December	3	0	0	3	23,905
Total	36	2	0	34	239,732

TEXAS PANHANDLE
(District 10)

Development Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Carson	48	37	5	6	152,424
Collingsworth	10	0	10	0	20,437
Gray	171	104	45	22	478,727
Hansford	12	1	10	1	41,454
Hartley	4	0	4	0	13,380
Hutchinson	216	198	6	12	647,055
Moore	42	0	41	1	136,776
Potter	26	0	26	0	65,728
Sherman	137	0	133	4	445,799
Wheeler	26	7	14	5	56,706
Lips (field)	1	1	0	0	9,223
Total	693	348	294	51	2,067,709

TEXAS PANHANDLE
(District 10)

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Armstrong	1	0	0	1	7,012
Briscoe	6	0	0	6	47,868
Castro	1	0	0	1	9,650
Childress	6	0	0	6	32,457
Collingsworth	2	0	0	2	12,782
Donley	4	0	0	4	20,865
Hall	2	0	0	2	11,191
Hansford	1	1	0	0	5,416
Hartley	1	0	0	1	4,464
Ochiltree	3	1	0	2	27,234
Oldham	7	0	0	7	45,384
Randall	1	0	0	1	8,244
Sherman	1	0	0	1	7,165
Total	36	2	0	34	239,732

SOUTHEAST NEW MEXICO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	30	25	0	5	149,358
February	39	27	3	9	203,165
March	48	32	2	14	217,434
April	36	23	1	12	197,377
May	44	26	2	16	219,505
June	28	19	2	7	172,232
July	42	23	2	17	234,823
August	26	20	1	5	125,769
September	39	32	3	4	273,128
October	46	28	3	15	256,593
November	58	39	4	15	328,053
December	68	52	1	15	421,346
Total	504	*346	24	134	2,798,783

*Incl. 1 distillate.

SOUTHEAST NEW MEXICO
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	11,029
February	5	0	1	4	17,851
March	7	2	0	5	46,778
April	6	1	0	5	36,409
May	11	1	0	10	55,853
June	3	1	0	2	19,576
July	9	2	0	7	47,791
August	2	0	0	2	22,737
September	9	6	0	3	73,709
October	8	0	0	8	42,973
November	10	0	1	9	42,401
December	18	6	0	12	133,067
Total	90	19	2	69	550,174

SOUTHEAST NEW MEXICO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Chaves	14	1	0	13	63,062
Eddy	25	3	1	21	78,695
Lea	42	14	1	27	347,811
Lincoln	1	0	0	1	8,050
Roosevelt	8	1	0	7	52,556
Total	90	19	2	69	550,174

SOUTHEAST NEW MEXICO
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Artesia	13	12	0	1	29,821
Bagley-Hightower	7	6	0	1	77,182
Bagley-Pennsylvanian	4	3	1	0	41,002
Bagley-Siluri-an-Devonian	7	6	0	1	82,030
Black River	3	1	0	2	6,091
Bough	6	4	0	2	61,097
Brunson	18	18	0	0	140,747
Brunson, N.	13	13	0	0	103,842
Cooper-Jal	37	29	5	3	119,253
Crossroads	3	3	0	0	33,874
Denton	17	16	0	1	207,769
Drinkard	13	12	0	1	89,879
Drinkard, N.	3	3	0	0	22,901
Empire	22	13	0	9	11,478
Eunice, S.	6	2	4	0	21,534
Fren	8	8	0	0	17,572
Gladiola	6	4	0	2	66,625
Grayburg	14	14	0	0	42,356
Hare	14	14	0	0	110,577
Hobbs & NW. & E.	3	3	0	0	12,738
House	9	6	0	3	51,228
Langlie-Mattix & (deep)	38	28	8	2	138,676
Leonard	3	2	0	1	10,319

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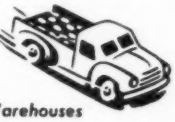

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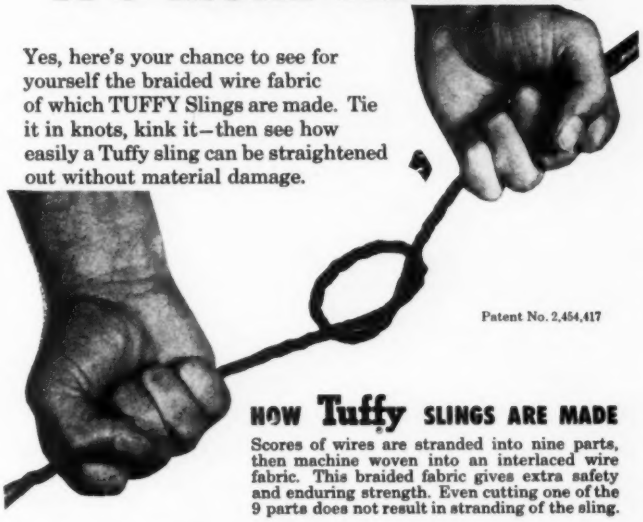

Patent No. 2,454,417

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Scores of wires are stranded into nine parts, then machine woven into an interlaced wire fabric. This braided fabric gives extra safety and enduring strength. Even cutting one of the 9 parts does not result in stranding of the sling.

11 TYPES—PROOF TESTED FOR SAFETY

There are 11 different types of Tuffy Slings, each one proof-tested to *twice* its safe working load. And the safe working load is plainly marked on metal tags on each sling. Also, Union Wire Rope engineers will help work out special sling problems. If you have your own rigging loft, Tuffy braided wire fabric is available by the reel.

FREE SAMPLE—MAIL COUPON

To show you the difference between TUFFY Braided Wire Slings and ordinary wire rope slings, we have made up a quantity of 3-foot slings. We want you to have one so that you can test it and prove to yourself that TUFFY Slings really are better. Mail the coupon below today for yours.

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Gentlemen: Please have my Union Wire Rope fieldman deliver me a FREE Tuffy Sling.

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Firm Name_____

Field—	Comp.	Oil	Gas	Dry	Footage
Maljamar	7	5	0	2	30,290
McMillan	6	4	0	2	5,690
Monument & E.	9	6	2	1	44,258
Red Lake	3	1	0	2	6,611
Saunders & S.	20	18	2	0	206,435
Skaggs	17	17	0	0	66,584
Teas	3	1	0	2	10,294
Turkey Track & E. & W.	8	5	0	3	20,800
Vacuum	9	9	0	0	42,518
Warren McKee	5	1	0	4	47,283
Watkins	3	1	0	2	9,937
Miscellaneous	57	39	0	18	259,163
Total	414	327	22	65	2,248,603

NORTHWEST NEW MEXICO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	19	1	14	4	76,000
February	14	0	13	1	58,031
March	19	1	16	2	75,607
April	11	0	10	1	22,839
May	15	0	13	2	45,439
June	20	0	16	4	81,658
July	30	0	27	3	96,412
August	18	1	16	1	76,409
September	31	0	26	5	120,086
October	7	0	3	4	27,747
November	36	0	33	3	113,532
December	49	1	43	5	174,325
Total	269	4	230	35	978,175

NORTHWEST NEW MEXICO
Wildcat Completions by Months

Month--	Comp.	Oil	Gas	Dry	Footage
January	4	1	1	2	19,570
February	0	0	0	0	0
March	3	1	1	1	11,896
April	0	0	0	0	0
May	0	0	0	0	0
June	2	0	0	2	9,072
July	2	0	0	2	7,149
August	1	1	0	0	6,692
September	1	0	0	1	5,560
October	1	0	0	1	1,900
November	0	0	0	0	0
December	1	0	0	1	2,722
Total	15	3	2	10	64,561

NORTHWEST NEW MEXICO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
McKinley	1	0	0	1	1,900
Rio Arriba	6	1	0	5	29,318
San Juan	7	2	2	3	30,621
Sandoval	1	0	0	1	2,722
Total	15	3	2	10	64,561

NORTHWEST NEW MEXICO
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Barker Dome	3	0	3	0	27,386
Blanco	46	0	46	0	226,661
Blanco area	31	0	27	4	113,611
Blanco NE	4	0	4	0	21,412
El Huerfano	5	0	2	3	16,018
Gallegos Canyon	2	0	2	0	3,085
Kutz-Fulcher	43	0	42	1	96,866
Kutz W.	51	0	40	11	93,194
LaPlata	20	0	19	1	107,360
Largo	25	0	25	0	117,658
Largo South	15	1	12	2	61,041
Miscellaneous	9	0	6	3	29,322
Total	254	1	228	25	913,614

NORTH LOUISIANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	99	54	12	33	380,659
February	60	28	8	24	243,388
March	81	46	11	24	323,183
April	79	42	8	29	310,550
May	81	36	10	35	358,989
June	112	57	13	42	364,939
July	103	46	11	46	367,782
August	141	72	9	60	588,988
September	107	54	11	42	411,775
October	149	79	20	50	489,141
November	106	62	10	34	400,446
December	131	59	17	55	501,304
Total	1,249	*635	140	†474	4,741,144

*Incl. 23 distillate. †Incl. 1 service.

NORTH LOUISIANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	17	2	0	15	83,293
February	12	1	0	11	64,787
March	10	1	2	7	62,740
April	14	0	1	13	58,391
May	16	3	0	13	76,760
June	13	2	0	11	59,916
July	17	1	0	16	88,363
August	23	1	0	22	153,772
September	22	2	1	19	128,322
October	21	1	0	20	133,729
November	18	2	1	15	108,379
December	27	1	1	25	112,337
Total	210	17	6	187	1,130,789

NORTH LOUISIANA
Wildcat Completions by Parishes

Parish—	Comp.	Oil	Gas	Dry	Footage
Avoyelles	1	1	0	0	6,518
Bienville	8	1	0	7	39,918
Bossier	12	0	0	12	47,497
Caddo	18	3	2	13	82,552
Caldwell	1	0	0	1	3,521
Catahoula	18	1	0	17	120,975
Claiborne	8	1	0	7	60,957
Concordia	36	4	0	32	256,909
De Soto	16	0	1	15	59,357
East Carroll	1	0	0	1	3,514
Franklin	5	0	0	5	25,491
Grant	12	0	0	12	49,793
Jackson	1	0	0	1	6,653
La Salle	23	3	0	20	105,792
Lincoln	4	1	2	1	34,293
Madison	5	0	0	5	15,436
Morehouse	1	0	0	1	6,088
Natchitoches	3	0	0	3	16,939
Ouachita	3	0	0	3	19,522
Red River	5	0	0	5	18,208
Richland	1	0	0	1	4,505
Sabine	6	0	0	6	24,388
Tensas	3	0	0	3	22,625
Union	2	0	0	2	16,411

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SNATCH BLOCKS
No Other
Can Compare
Undoubtedly the World's most durable Snatch Block, the LeBus Block may be readily adapted for all purposes through its complete interchangeability of parts. It is completely drop forged of alloy and high carbon steel and is thoroughly heat treated for strength and durability. LeBus Snatch Blocks are given the full strength test before leaving the plant and are fully guaranteed.
● EASILY ASSEMBLED OR DISASSEMBLED
● No Tools Needed
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● Easy Line Insertion
● No Sparking Danger
● Used with wire line or Manila Rope
● Bearing Oil & Dust Seal
WRITE FOR BULLETIN
EASILY OPENED
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TULSA, OKLAHOMA

Parish—	Comp.	Oil	Gas	Dry	Footage
Webster	5	2	0	3	32,722
West Carroll	4	0	1	3	23,288
Winn	8	0	0	8	26,917
Total	210	17	6	187	1,130,789

NORTH LOUISIANA

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Ada	7	3	3	1	48,378
Alabama Bend	4	2	0	2	11,360
Ashland	3	0	0	3	10,049
Athens	23	9	12	2	183,989
Beckman	3	2	1	0	11,360
Bellevue	45	36	2	7	26,790
Bellevue, E.	6	2	0	4	25,968
Benton	3	3	0	0	24,427
Big Creek-Delhi	10	5	0	5	31,792
Big Island	12	1	0	11	68,135
Caddo-Pine Island	333	287	7	39	575,889
Catahoula Lake	11	4	0	7	52,270
Catahoula Lake, W.	17	8	0	9	74,649
Chaney Lake	3	0	0	3	22,406
Cocodrie Lake	4	0	0	4	27,600
Converse	3	1	0	2	8,481
Cotton Valley	8	5	2	1	67,265
Delhi	23	13	1	9	68,712
DeSoto-Red River	105	55	4	46	297,110
Dykesville	5	3	0	2	28,447
Elm Grove	5	2	2	1	15,975
Esperance Point	6	5	0	1	41,678
Fairview	7	5	0	2	49,330
Grand Cove	5	3	0	2	15,457
Haynesville	15	14	0	1	149,885
Haynesville, E.	16	14	0	2	100,773
Joyce	9	4	0	5	10,532
Kickapoo	4	0	0	4	18,729
Knowles	10	4	0	6	62,229
Lake St. John	3	1	0	2	17,216
Lake St. Joseph	3	0	0	3	26,670
Larto Lake, S.	4	2	0	2	25,913
Lisbon	10	6	0	4	69,021
Lisemore Landing	8	3	0	5	50,724
Little Creek	5	2	0	3	9,015
Logansport	12	8	3	1	73,743
Millhaven	3	0	2	1	15,687
Monroe	64	0	61	3	147,637
Nebo	15	7	0	8	63,406
Olla	6	3	0	3	19,466
Olla, S.	4	1	0	3	11,390
Pool Lake	5	1	0	4	27,437
Ruston	11	3	6	2	103,352
Sabine Lake	6	3	0	3	36,335
Sarepta, S.	3	3	0	0	28,610
Shongaloo	3	0	0	3	25,507
Shongaloo, N.	13	11	0	2	76,213
Sibley	10	0	9	1	58,218
Simsboro	4	0	4	0	29,764
Sligo	10	10	0	0	31,363
Unionville	4	2	1	1	37,154
Urania	18	10	0	8	27,809
Vidalia	5	2	0	3	30,855
Virgin Bend	3	0	0	3	7,352
Waskom	52	41	7	4	189,584
Zwolle	5	1	0	4	14,607
Miscellaneous	45	8	7	30	226,642
Total	1,039	618	134	287	3,610,355

SOUTH LOUISIANA

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	88	56	3	29	811,793
February	78	45	2	31	743,471
March	93	49	4	40	888,725
April	69	38	3	28	641,307
May	80	46	3	31	718,014
June	74	42	2	30	695,224
July	77	42	3	32	766,659
August	88	54	3	31	842,453
September	70	42	3	25	691,952
October	93	55	2	36	896,845
November	95	54	5	36	910,573
December	86	60	3	23	837,487
Total	991	*583	36	†372	9,447,503

*Incl. 58 distillate. †Incl. 2 service.

SOUTH LOUISIANA

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	12	2	0	10	116,554
February	14	4	0	10	156,630
March	22	7	1	14	245,236
April	8	0	0	8	82,943
May	8	3	0	5	91,789
June	11	5	0	6	118,776
July	14	2	0	12	153,950
August	20	6	1	13	212,399
September	10	2	1	7	109,408
October	17	4	0	13	164,720
November	17	2	0	15	182,925
December	16	4	0	12	170,549
Total	169	41	3	125	1,805,929

SOUTH LOUISIANA

Wildcat Completions by Parishes

Parish—	Comp.	Oil	Gas	Dry	Footage
Acadia	8	1	0	7	73,840
Allen	1	1	0	0	7,515
Ascension	3	1	0	2	35,716
Assumption	3	1	0	2	21,728
Avoyelles	18	1	0	17	165,514
Beauregard	8	3	0	5	74,881
Calcasieu	5	2	0	3	50,548
Cameron	10	2	0	8	110,690
E. Baton Rouge	3	1	0	2	30,567
Iberia	5	2	0	3	65,910
Iberville	4	1	0	3	44,202
Jefferson	4	0	0	4	48,181
Lafourche	10	3	0	7	129,304
Livingston	5	1	0	4	50,056
Orleans	1	0	1	0	13,270
Plaquemines	23	8	0	15	247,817
Pointe Coupee	6	1	0	5	57,226
Rapides	8	0	0	8	70,083
St. Landry	4	0	0	4	41,450
St. Martin	3	2	0	1	33,799
St. Marys	3	2	1	0	42,739
Terrebonne	17	5	1	11	215,273
Vermilion	5	0	0	5	59,618
Washington	1	1	0	0	9,059
W. Baton Rouge	2	2	0	0	20,087
Miscellaneous	9	0	0	9	86,656
Total	169	41	3	125	1,805,929

SOUTH LOUISIANA

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Abbeville	5	2	0	3	44,867
Angie	4	0	3	1	36,175
Anse La Butte	6	5	0	1	44,606
Avondale	10	8	0	2	87,605
Bateman Lake	4	1	0	3	48,617
Bayou Blue	8	6	0	2	44,010
Bayou Choctaw	8	8	0	0	64,169
Bayou Couba	9	8	0	1	65,961
Bayou Mallet	6	4	1	1	54,692
Bayou Sale	4	3	1	0	42,987
Bay De Chene	8	5	0	3	88,610
Bay Junop	4	0	0	4	30,964
Bay St. Elaine	8	7	0	1	83,941
Big Island	15	4	0	11	86,919
Bully Camp	12	10	0	2	90,323
Caillou Island	18	14	0	2	164,731
Charenton	6	3	0	3	42,178
Cox Bay	27	23	1	3	292,903
Cowpen Creek	4	1	0	3	36,023
Crowley	4	4	0	0	44,557
Delacroix	5	3	0	2	50,245
Delta Duck Club	4	3	0	1	41,579
DeQuincy	9	4	0	5	57,615
Dog Lake	12	5	1	6	63,069
Duck Lake	22	21	1	0	271,619
E. Moss Lake	4	3	0	1	36,196
Edgerly	7	3	0	4	39,007
Ellis	4	1	1	2	39,089
Eugene Island-Block 126	5	2	0	3	59,660
Fordoche	13	8	1	4	128,691
Four Isle Dome	4	0	0	4	31,667
Garden Island Bay	11	5	1	5	71,984
Glenmora	9	4	0	5	160,196
Golden Meadow	16	10	0	6	124,047
Hurricane Creek	5	5	0	0	48,641
Iota	4	0	0	4	37,502
Iowa	12	12	0	0	130,931
Jennings	6	4	0	2	22,243
Krotz Springs	8	8	0	0	80,286
Lake Arthur	4	2	2	0	42,272
Lake Maurepas	7	4	0	3	70,978
Lake Mongoulois	4	2	0	2	46,523
Lake Pelto	12	10	0	2	120,065
Lake Washington	19	9	1	9	107,902
Leeville	10	7	0	3	114,422
Lockport	7	6	0	1	44,312
Napoleonville	11	6	0	5	63,278
N. Black Bay	4	4	0	0	36,871
N. Tepetate	8	5	0	3	51,867
Opelousas	6	4	0	2	69,460
Phoenix Lake	12	10	0	2	99,182
Pointe a la Hache	20	17	0	3	221,015
Port Barre	9	5	0	4	63,407
Potash	4	0	2	2	33,400
Quarantine Bay	12	5	0	7	118,557
Richie	4	1	0	3	21,451
Romere Pass	25	24	0	1	253,123
Savoy	6	4	1	1	63,227
Section 28	8	6	0	2	83,808
S. Bayou Mallet	5	5	0	0	49,879
Sorrento	4	1	0	3	18,765
S. Lewisburg	5	4	0	1	53,334
St. Gabriel	7	5	0	2	69,513
Sunshine	5	2	2	1	53,412
Timbalier Bay	15	11	0	4	146,670
Valentine	12	9	0	3	116,711
Venice	9	8	0	1	100,499
Vinton	7	5	0	2	45,578
Weeks Island	24	24	0	0	291,698
Welsh	5	4	0	1	38,552
West Bay	10	8	0	2	94,380
West Hackberry	8	4	0	4	48,802
West Lake Verret	4	2	1	1	42,273
Miscellaneous	182	102	13	67	1,817,169
Total	822	542	33	247	7,641,574

ARKANSAS

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	41	25	1	15	139,908
February	23	14	0	9	72,488
March	21	11	1	9	75,545
April	35	19	0	16	138,398
May	29	19	0	10	99,538
June	36	20	0	16	116,973
July	33	13	1	19	110,170
August	48	23	1	24	168,154
September	37	23	0	14	135,642
October	49	23	5	21	175,542
November	38	25	0	13	153,225
December	39	20	1	18	136,840
Total	429	*235	10	184	1,522,423

*Incl. 1 distillate.

ARKANSAS

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	10	1	0	9	36,844
February	1	0	0	1	2,204
March	3	0	0	3	12,715
April	12	2	0	10	49,103
May	13	4	0	9	59,215
June	5	1	0	4	25,694
July	11	0	1	10	39,458
August	12	1	0	11	48,212
September	7	3	0	4	33,785
October	15	1	0	14	63,195
November	3	0	0	3	15,011
December	7	0	0	7	18,634
Total	99	13	1	85	404,070

ARKANSAS

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Baxter	1	0	0	1	1,203
Bradley	1	0	0	1	5,020
Calhoun	4	0	0	4	12,520
Clark	2	0	0	2	1,864
Cleveland	2	0	0	2	7,790
Chicot	1	0	0	1	3,620
Columbia	8	1	0	7	62,512
Crittenden	1	0	0	1	3,260
Drew	1	0	0	1	4,006
Franklin	1	0	0	1	3,715
Hempstead	6	0	0	6	8,192
Independence	1	0	0	1	505
Johnson	2	0	1	1	5,960
La Fayette	6	0	0	6	38,574
Lincoln	1	0	0	1	4,204
Little River	2	0	0	2	9,454
Lonoke	1	0	0	1	1,308
Madison	1	0	0	1	982
Miller	5	2	0	3	24,074
Nevada	9	1	0	8	27,614
Ouachita	13	0	0	13	41,204
Poinsett	1	0	0	1	2,657
Prairie	1	0	0	1	2,876

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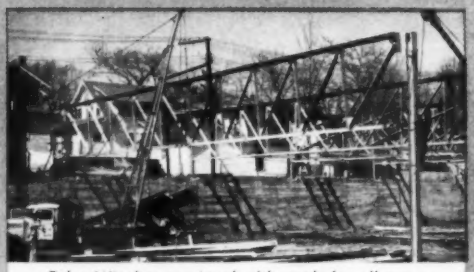

Tulsa Winches are invaluable tools for all types of light and heavy construction.

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For many years, Tulsa Winches have proved versatile and rugged to oil industry haulers.

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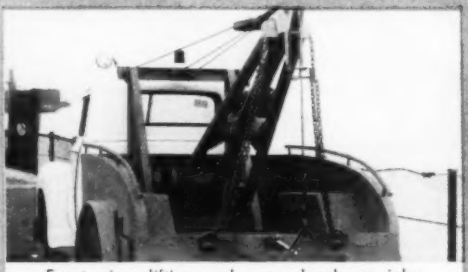

For towing, lifting and general salvage jobs, wrecker operators specify Tulsa Winches.

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Public utilities choose Tulsa Winches for setting poles and transformers; handling cable reels.

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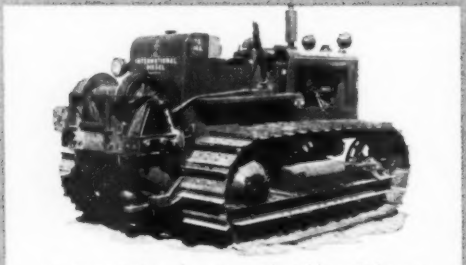
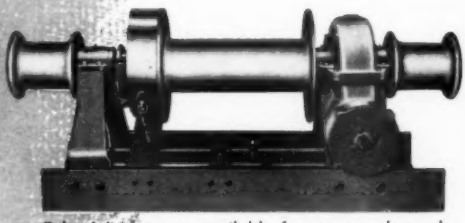


In construction, logging, oil field and heavy hauling, Tulsa Winches save time and labor.



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Tulsa* Winch
TULSA, OKLAHOMA
DIVISION OF VICKERS Inc.

*Reg. U. S. Pat. Off.

815-32 E. First Street

County—	Comp.	Oil	Gas	Dry	Footage
Union	27	9	0	18	129,633
White	1	0	0	1	1,323
Total	99	13	1	85	404,070

ARKANSAS

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Bear Creek	14	7	0	7	65,531
Bodcaw	7	4	0	3	20,075
Cecil	3	0	3	0	14,952
Champagnolle	13	5	0	8	45,939
El Dorado, E.	20	14	1	5	57,571
El Dorado, S.	3	1	0	2	6,760
Falcon	12	8	0	4	18,845
Fouke	12	8	0	4	57,984
Hillsboro	5	5	0	0	12,235
Lewisville, W.	9	7	0	2	25,998
Nick Springs	8	3	0	5	26,658
Pace City	4	3	0	1	14,131
Ramsey Creek	3	3	0	0	9,358
Sandy Bend	41	40	0	1	96,930
Schuler, E.	12	11	0	1	84,780
Shongaloo, N.	3	1	0	2	17,737
Smackover	41	27	0	14	114,645
Spirit Lake	11	5	0	6	46,592
Stephens	9	8	0	1	30,398
Troy	3	2	0	1	5,148
Trull	3	0	0	3	12,287
Tubal	3	0	0	3	28,054
Urbana	44	38	1	5	133,715
Wesson	6	3	0	3	16,846
Willisville	6	4	0	2	8,593
Miscellaneous	35	15	4	16	146,591
Total	330	222	9	99	1,118,353

MISSISSIPPI

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	16	10	0	6	110,145
February	17	6	0	11	120,929
March	22	5	0	17	156,783
April	21	12	0	9	148,119
May	41	16	5	20	298,061
June	32	15	1	16	206,708
July	37	17	1	19	215,991
August	47	15	0	32	284,713
September	31	9	1	21	216,899
October	33	13	0	20	241,901
November	43	8	0	35	301,910
December	35	11	1	23	236,866
Totals	375	*137	9	†229	2,539,025

*Incl. 13 distillate. †Incl. 1 service.

MISSISSIPPI

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	6	3	0	3	43,218
February	10	1	0	9	75,260
March	10	0	0	10	71,015
April	10	3	0	7	76,183
May	14	2	0	12	107,829
June	11	0	0	11	75,721
July	10	1	0	9	70,253
August	23	1	0	22	151,037
September	18	2	0	16	132,031
October	16	3	0	13	128,074
November	26	2	0	24	198,275
December	20	3	1	16	144,759
Total	174	21	1	152	1,273,655

MISSISSIPPI

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Adams	60	8	1	51	414,199
Amite	4	0	0	4	31,636
Forrest	3	2	0	1	23,381
Franklin	10	4	0	6	82,486
Jefferson	24	3	0	21	163,942
Jones	5	0	0	5	41,266
Lamar	3	1	0	2	20,127
Madison	3	1	0	2	26,425
Washington	4	0	0	4	19,646
Wayne	9	0	0	9	56,220
Wilkinson	10	1	0	9	75,968
Yazoo	3	1	0	2	31,285
Miscellaneous	36	0	0	36	287,074
Total	174	21	1	152	1,273,655

MISSISSIPPI

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Baxterville	11	9	0	2	91,653
Cary	4	2	0	2	13,127
Church Hill	10	7	0	3	56,458

Field—	Comp.	Oil	Gas	Dry	Footage
Cranfield	4	3	0	1	28,015
Fayette	34	17	2	15	145,004
Glen Aubin	5	2	0	3	34,897
Hub	4	3	0	1	36,728
Kingston	10	8	0	2	68,880
LaGrange-S	9	3	0	6	59,569
New Era	4	1	0	3	26,493
Pine Ridge	7	1	0	6	41,818
Sandy Hook	12	4	6	2	108,503
S. White Apple	4	0	0	4	28,011
Tinsley	13	12	0	1	69,010
West Lincoln	6	2	0	4	64,505
Yellow Creek	29	23	0	6	143,295
Miscellaneous	35	19	0	16	249,399
Total	201	116	8	77	1,265,370

ALABAMA

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	7	2	0	5	35,729
February	4	3	0	1	18,530
March	3	3	0	0	14,302
April	5	2	0	3	21,555
May	8	4	0	4	43,101
June	3	1	0	2	18,874
July	3	1	0	2	14,580
August	3	0	0	3	15,623
September	7	1	0	6	44,346
October	2	0	0	2	9,270
November	3	0	0	3	19,529
December	2	0	0	2	13,583
Total	50	17	0	33	269,022

ALABAMA

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	18,508
April	2	0	0	2	11,500
May	3	0	0	3	19,369
June	2	1	0	1	11,934
August	1	0	0	1	6,525
September	5	0	0	5	33,426
October	2	0	0	2	9,270

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NEEDLE VALVES

FORGED STEEL for HIGH PRESSURE AND CORROSIVE SERVICES

Globe and angle types in specific materials for ordinary or corrosive services. 8000 lb. working pressures at 150 deg. F. Safety union bonnet design permits packing under pressure. Conical stem tip gives micrometer throttling action. Sizes ⅛" to ¾".

Write for descriptive bulletin 51-N

KEROTEST MANUFACTURING COMPANY

Pittsburgh 22, Pa.

New York Chicago Charleston, W. Va. Tulsa Odessa Houston Los Angeles St. Louis Toledo Richmond Baltimore

Month—	Comp.	Oil	Gas	Dry	Footage
November	3	0	0	3	19,529
December	1	0	0	1	10,020
Total	21	1	0	20	140,081

ALABAMA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Baldwin	1	0	0	1	10,008
Butler	1	0	0	1	8,003
Choctaw	3	1	0	2	11,913
Clarke	5	0	0	5	29,419
Covington	1	0	0	1	6,023
Escambia	1	0	0	1	6,575
Franklin	1	0	0	1	2,007
Mobile	4	0	0	4	37,762
Monroe	2	0	0	2	13,334
Washington	2	0	0	2	15,037
Total	21	1	0	20	140,081

ALABAMA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Carlton, S.	12	7	0	5	69,989
Gilbertown	17	9	0	8	58,952
Total	29	16	0	13	128,941

FLORIDA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
September	1	0	0	1	12,600
December	1	0	0	1	7,494
Total	2	0	0	2	20,094

FLORIDA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
September	1	0	0	1	12,600
December	1	0	0	1	7,494
Total	2	0	0	2	20,094

FLORIDA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Collier	1	0	0	1	12,600
Escambia	1	0	0	1	7,494
Total	2	0	0	2	20,094

OKLAHOMA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	575	325	24	226	2,209,978
February	328	190	11	127	1,228,576
March	431	232	17	182	1,529,938
April	511	277	19	215	1,852,567
May	470	261	23	186	1,734,739
June	397	229	23	145	1,439,970
July	462	258	23	181	1,653,811
August	553	301	38	214	1,989,323
September	389	207	17	165	1,423,911
October	527	294	25	208	1,865,716
November	535	295	24	216	1,981,203
December	448	240	21	187	1,632,616
Total	5,626	*3,109	265	†2,252	20,542,348

*Incl. 94 distillate. †Incl. 177 service.

OKLAHOMA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	88	8	2	78	386,618
February	36	5	0	31	153,051
March	70	11	2	57	252,566
April	83	9	3	71	312,572
May	59	8	2	49	230,923
June	44	7	1	36	186,848
July	73	14	0	59	317,534
August	94	17	1	76	391,651
September	73	13	3	57	330,806
October	62	11	0	51	286,666
November	70	8	2	60	322,355
December	78	13	2	63	351,366
Total	830	124	18	688	3,522,961

OKLAHOMA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Alfalfa	1	1	0	0	5,935
Atoka	2	0	0	2	5,922

CUT CORROSION PROBLEMS DOWN TO SIZE...

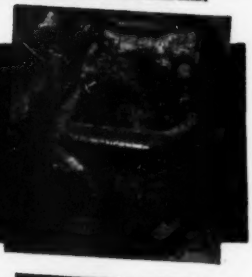
WITH TAPECOAT*

—the Coal Tar Coating in Handy Tape Form

—Sized to the job

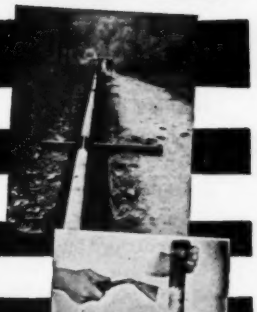
24" WIDTH

TAPECOAT — the economical coal tar coating for "cigarette-wrapping" mechanical couplings, large diameter pipe, joints, bends and drips.



18" WIDTH

TAPECOAT—the practical coal tar protection for "cigarette-wrapping" of large couplings, pipe bends, and joints on large diameter pipe.



6, 4, 3, and 2" WIDTHS

TAPECOAT — the distinctive, time-tested coal tar tape for spiral-wrapping welded field joints, service connections, pipe under streets and sidewalks, and pipe through building walls.

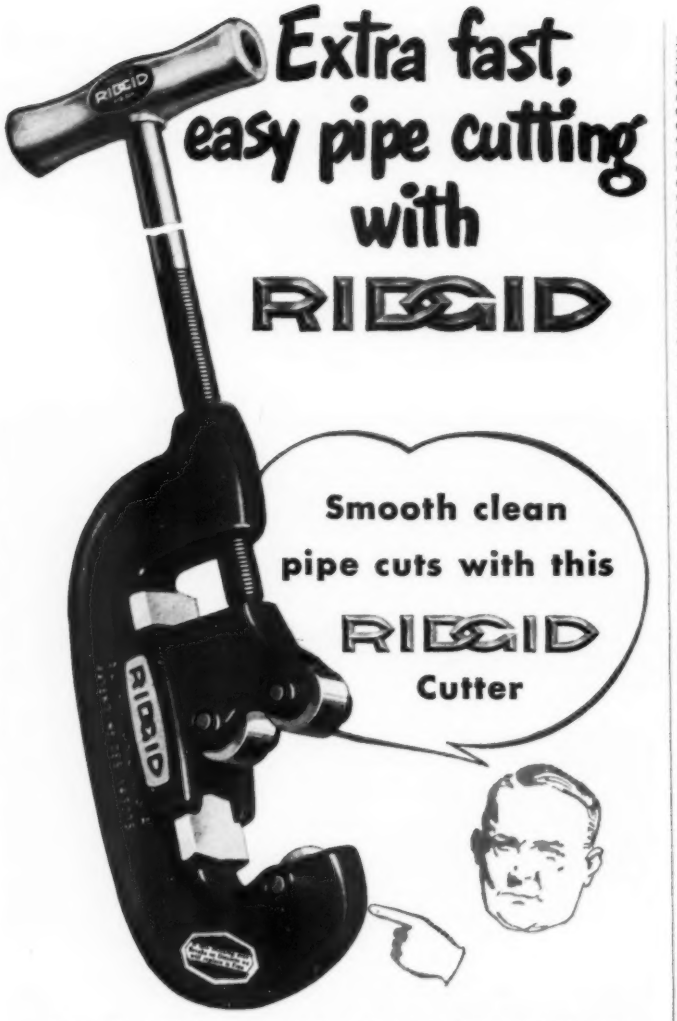
For more than 10 years, Tapecoat engineers have specialized in pipe joint protection. Call on them to help you meet your individual requirements. Write today for complete details.

The TAPECOAT Company

Originators of the Coal Tar Tape for Pipe Joint Protection

1539 LYONS STREET • EVANSTON, ILLINOIS

*Reg. U.S. Pat. Off.



• It rolls right through any pipe with least effort, quick almost burrless cuts—factory tested, tracks perfectly. Special thin-blade cutter wheel for extra fast cutting—or heavy-duty wheel for extra long service. Guaranteed warp-proof special malleable housing. Five models to 6" pipe; 4-wheel short-handle models for speedy cutting in tight places. For tops in clean easy pipe cutting, buy RIDGID Cutters at your Supply House.

RIDGID

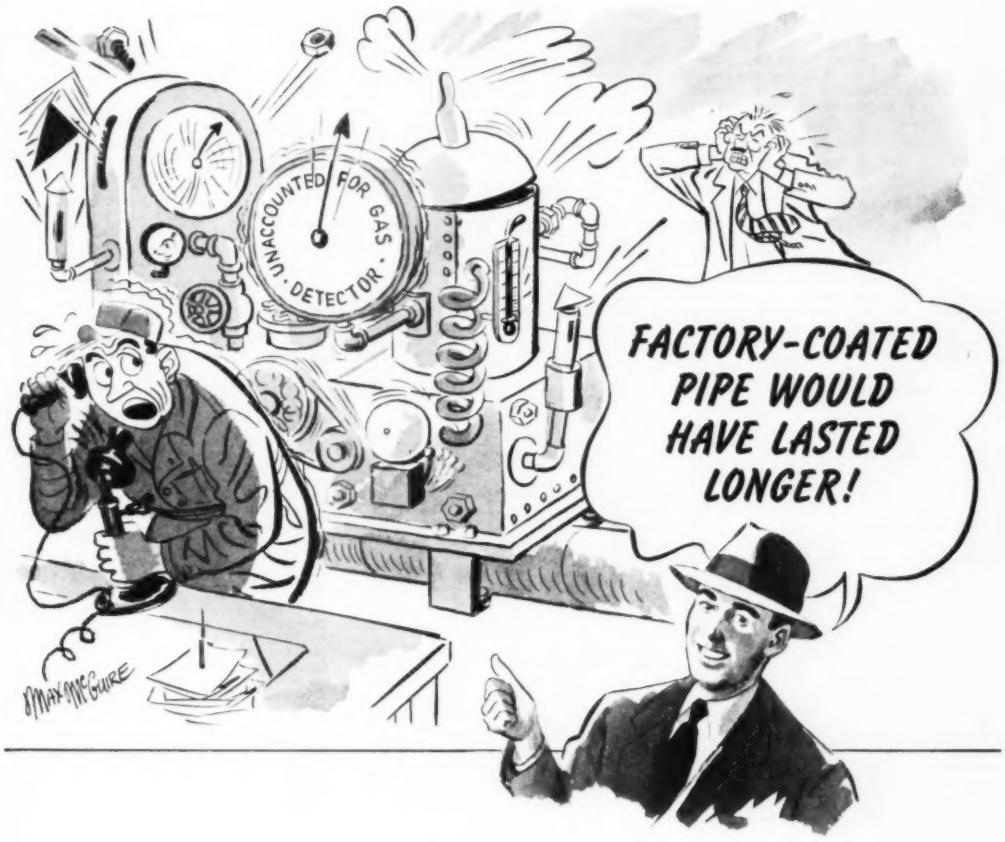
★ Work-Saver Pipe Tools ★

County—	Comp.	Oil	Gas	Dry	Footage
Beaver	3	0	0	3	20,870
Beckham	12	3	0	9	88,238
Bryan	5	0	0	5	16,662
Caddo	4	1	0	3	9,329
Canadian	2	0	0	2	20,310
Carter	38	9	3	26	187,727
Choctaw	4	0	0	4	5,249
Cleveland	11	1	0	10	73,916
Coal	5	0	1	4	31,309
Comanche	18	1	1	16	48,905
Cotton	38	1	0	37	81,249
Creek	21	3	1	17	52,532
Garfield	15	2	0	13	73,091
Garvin	18	3	0	15	72,922
Grady	10	4	1	5	84,052
Grant	6	0	0	6	31,940
Greer	2	0	0	2	2,922
Harmon	1	0	0	1	7,515
Harper	1	0	0	1	6,737
Haskell	1	0	0	1	3,026
Hughes	20	1	3	16	75,503
Jackson	7	1	0	6	32,350
Jefferson	17	1	0	16	55,204
Johnston	3	1	0	2	4,554
Kay	32	3	0	29	128,070
Kingfisher	5	0	0	5	31,053
Kiowa	6	0	0	6	3,156
Latimer	1	0	0	1	3,000
Le Flore	2	0	0	2	7,775
Lincoln	86	13	2	71	367,868
Logan	33	6	1	26	190,046
Love	11	5	0	6	64,081
Marshall	4	1	0	3	9,227
Mayes	2	0	0	2	9,809
McClain	7	2	0	5	51,258
McIntosh	4	0	0	4	13,113
Major	4	3	0	1	28,650
Murray	10	1	0	9	12,641
Muskogee	11	2	0	9	20,565
Noble	37	2	1	34	170,889
Okfuskee	20	4	0	16	75,113
Oklahoma	13	1	0	12	84,457
Okmulgee	7	0	0	7	16,211
Osage	28	6	0	22	83,255
Pawnee	30	3	0	27	95,310
Payne	41	12	0	29	170,861
Pittsburg	4	1	0	3	4,220
Pontotoc	23	1	1	21	62,997
Pottawatomie	22	8	0	14	108,253
Roger Mills	3	0	0	3	28,006
Seminole	17	3	0	14	63,311
Sequoyah	1	0	0	1	1,250
Stephens	75	11	1	63	361,257
Texas	2	0	2	0	5,396
Tillman	8	1	0	7	35,105
Wagoner	3	0	0	3	3,245
Washita	6	2	0	4	55,810
Woods	4	0	0	4	31,052
Woodward	3	0	0	3	28,682
Total	830	124	18	688	3,522,961

OKLAHOMA

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Ada	8	3	0	5	11,621
Ada, E.	11	4	1	6	18,588
Alko	7	4	0	3	10,061
Allen	64	29	2	33	141,948
Alma, N.	20	20	0	0	106,099
Antioch, SW.	29	29	0	0	217,842
Ara	51	46	1	4	268,928
Arno, W.	24	19	1	4	70,879
Avant	13	0	1	12	23,826
Avant, W.	16	7	0	9	30,011
Aylesworth	7	6	0	1	20,187
Bald Hill	39	25	1	13	54,055
Barnsdall	7	4	0	3	12,530
Bayou	51	47	0	4	194,977
Beaver	9	4	0	5	73,151
Bebee	59	51	1	7	144,064
Bebee, NE.	15	15	0	0	39,127
Benjamin	8	5	0	3	27,063
Big Pond	20	14	2	4	54,085
Blackwell	27	24	0	3	86,437
Boynton	7	4	0	3	14,303
Brinton	7	6	0	1	13,389
Brock	12	9	0	3	19,575
Brock, W.	6	4	0	2	26,512
Broken Arrow	7	2	1	4	9,076
Burbank	52	19	0	33	153,996
Butcher	7	5	0	2	24,602
Camp	17	17	0	0	83,198
Cement	21	17	0	4	75,364
Cement, W.	18	12	0	6	89,511
Ceres, S.	14	11	0	3	61,628
Coalton	19	6	0	13	29,838
Coyle, SW.	6	6	0	0	30,750



WHY?

Hill, Hubbell factory-coated pipe lasts longer because all conditions can be precisely controlled at the factory and they can't in the field. With Roto-Grit Blast, we carefully clean every joint of pipe before coating. All coatings and wrappings are precision applied at uniform temperature. Every joint is inspected with electronic holiday detectors before leaving the factory.

Hill, Hubbell and Company

Division of GENERAL PAINT CORPORATION

Headquarters: 3091 Mayfield Road, Cleveland 18, Ohio

Leaders in Pipe Protection for a Quarter Century

PLANTS: Lorain, Ohio ☆ Youngstown Area—at Girard, Ohio
Chicago Area—at Hammond (Gibson), Indiana.
Railroad in transit privileges.

Field—	Comp.	Oil	Gas	Dry	Footage
Cruce	29	18	1	10	91,067
Cushing	92	59	0	33	253,207
Cushing, E.	14	11	0	3	38,157
Davenport	7	5	0	2	27,918
Davenport, S.	13	7	1	5	40,882
Davenport, W.	50	39	2	9	191,532
Deaner	13	8	0	5	38,197
Deep Fork	6	4	0	2	16,415
Dewar	7	6	0	1	14,706
Domes	19	13	0	6	32,667
Dora	7	5	0	2	22,414
Doyle	31	27	0	4	199,571
Duncan, N.	7	1	0	6	16,686
Elk City	79	73	1	5	817,133
Empire-Comanche	22	8	1	13	48,480
Eram	13	5	0	8	20,475
Flat Rock	22	7	0	15	31,569
Fox-Graham	146	135	1	10	712,396
Fort Sill	17	6	1	10	15,719
Garber	9	2	0	7	17,673
Garber, SE.	9	3	0	6	21,853
Garr, N.	10	6	0	4	31,449
George	13	7	0	6	15,068
Glenn	20	15	0	5	30,699
Greasy Creek	19	4	6	9	52,912
Green Valley, NW.	7	2	0	5	15,655
Hallett	7	4	0	3	19,466
Hallett, NW.	6	0	0	6	15,659
Hanbury	23	16	0	7	49,982
Hawkins, NW.	8	6	0	2	9,155
Healdton	15	10	0	5	35,986
Hewitt	8	7	0	1	33,985
Holdenville, W.	11	3	2	6	33,288
Hoover, N.	6	3	0	3	21,335
Hoover, NW.	22	12	1	9	51,651
Jennings	8	7	0	1	22,109
Katie	25	24	0	1	179,155
Kellyville	14	11	0	3	29,331
Kellyville, S.	9	3	0	6	23,196
Kellyville, W.	6	2	0	4	15,158
Keystone	9	4	1	4	18,315
Knox	20	14	0	6	72,021
Knox, SE.	9	8	1	0	27,234
Komalty	7	3	0	4	4,060
Konawa	6	2	0	4	16,423
Laffoon, NW.	6	3	3	0	18,773
Langston	6	5	0	1	28,349
Lauderdale	33	21	0	12	77,288
Lawton	110	54	2	54	41,102
Lindsay, E.	10	10	0	0	99,129
Lindsay, NE.	7	6	0	1	62,076
Lindsay, SE.	6	6	0	0	52,908
Loco	18	7	0	11	23,587
Lucien	38	34	0	4	146,215
Mammoth, NE.	6	6	0	0	28,238
Mannford	34	23	1	10	82,771
Mannford, N.	6	4	0	2	13,307
March	15	5	3	7	51,066
Markham, W.	14	10	0	4	44,031
Marlow, W.	16	11	0	5	112,539
Marshall, N.	8	6	0	2	40,004
Maud	27	23	0	4	111,152
Maysville, SW.	22	21	0	1	170,633
Mervine, N.	6	3	0	3	18,307
Milroy	35	30	0	5	131,503
Milroy, N.	41	40	0	1	218,421
Morris	9	1	1	7	17,382
Mosquito Creek	13	12	0	1	50,037
Muskogee	23	12	0	11	35,865
Naval Reserve	6	5	0	1	16,274
Naval Reserve, NW.	10	10	0	0	27,286
New Hope, SE.	41	38	0	3	368,141
Norfolk	6	2	0	4	19,078
Norfolk, SE.	7	6	0	1	21,721
Oklahoma City	7	6	0	1	45,420
Okmulgee	12	8	0	4	19,360
Olive	10	4	0	6	26,089
Olympic	42	4	5	33	84,784
Osage City	14	9	0	5	20,026
Oscar	19	14	0	5	29,097
Otoe City, NW.	14	8	0	6	47,559
Palacine	20	13	0	7	67,722
Palacine, S.	41	26	0	15	103,385
Panhandle	145	0	145	0	397,267
Panther Creek	10	9	0	1	74,053
Panther Creek, SW.	28	28	0	0	229,988
Pauls Valley, W.	9	7	0	2	43,128
Peavine	24	23	0	1	148,851
Peck, W.	40	35	0	5	128,498
Perry	7	3	0	4	19,425
Pershing	11	3	0	8	22,984
Pollyanna	7	4	0	3	16,758
Prue	6	3	0	3	10,100
Rabbit Creek, W.	7	3	0	4	12,496
Randlett, S.	8	6	0	2	12,765
Red Bank	17	14	0	3	48,772
Red River	17	11	0	6	33,506
Rich Valley, SE.	8	8	0	0	46,610
Ringwood	65	63	0	2	469,588
Ripley, SE.	7	3	0	4	26,271
Robinson	13	2	1	10	28,447
Roper	6	5	0	1	15,584
Rosenwald	7	3	0	4	24,836
Roulette Creek	11	10	0	1	71,328
Sapulpa	25	12	0	13	43,821
Sapulpa, NW.	10	2	1	7	15,402
Sasakwa, SE.	6	3	0	3	7,180
Searight	9	5	1	3	28,203
Seay	17	8	0	9	16,531
Seminole	6	2	0	4	23,334
Shawnee, E.	8	4	0	4	37,989
Sholem Alechem	152	139	2	11	765,418
Sparks, E.	49	44	0	5	177,424
Sparks, S.	8	3	0	5	34,303
Sporn	8	7	0	1	32,541
Sporn, E.	11	7	0	4	44,470
Spring	15	9	0	6	28,305
St. Louis	44	23	0	21	172,159
Stroud	21	16	0	5	82,333
Tatums	87	72	0	15	195,664
Traugh	6	4	0	2	14,386
Tryon, NW.	27	24	1	2	112,560
Twin Lakes	6	5	0	1	21,881
Tyrola, E.	6	3	0	3	14,705
Union Valley	6	3	0	3	33,423
Valley Grove, S.	7	6	0	1	37,497
Velma	164	144	2	18	671,905
Wanette, E.	19	18	0	1	59,228
Watchorn, E.	7	7	0	0	27,936
Waterloo, SE.	11	8	1	2	66,144
Weleetka	6	4	0	2	14,218
Wetumka, E.	8	5	1	2	25,227
Wetumka, S.	10	4	1	5	34,356
Wheeler	8	5	0	3	10,898
Wildhorse	25	13	0	12	45,326
Witcher	16	11	2	3	101,147
Woodrow	17	6	0	11	36,166
Woolsey	6	3	0	3	13,273
Yale-Quay	68	49	0	19	209,074
Miscellaneous	1,108	469	44	595	3,597,758
Total	4,796	2,985	247	1,564	17,019,387

KANSAS

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	399	192	23	184	1,317,170
February	319	137	38	144	1,021,925
March	319	166	26	127	1,066,979
April	339	160	19	160	1,114,372
May	378	175	37	166	1,235,499
June	390	195	49	146	1,274,667
July	342	160	34	148	1,156,989
August	452	220	51	181	1,535,593
September	321	153	32	136	1,083,172
October	426	220	25	181	1,447,110
November	389	202	18	169	1,311,856
December	427	197	24	206	1,469,318
Total	4,501	2,177	376	*1,948	15,034,630

*Incl. 62 service wells.

KANSAS

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	75	14	0	61	258,130
February	64	6	2	56	229,894
March	56	11	1	44	195,215
April	72	9	0	63	261,085
May	90	17	2	71	319,871
June	81	10	0	71	282,101
July	99	14	1	84	359,353
August	116	24	3	89	419,889
September	76	10	2	64	284,542
October	85	7	0	78	318,842
November	78	7	0	71	286,633
December	114	10	1	103	444,104
Total	1,006	139	12	855	3,659,659

KANSAS

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Barber	14	0	1	13	69,947
Barton	105	21	0	84	360,379
Brown	2	0	0	2	7,582
Butler	61	6	0	55	176,700
Chase	8	1	0	7	20,140
Cheyenne	2	0	0	2	10,411
Clark	3	1	1	1	20,064
Clay	3	2	0	1	6,563
Coffey	5	0	0	5	9,550
Comanche	1	0	0	1	5,450
Cowley	30	3	0	27	91,127
Decatur	12	1	0	11	50,398
Dickinson	6	0	0	6	17,916
Edwards	4	0	0	4	19,727
Ellis	63	9	0	54	229,352
Ellsworth	14	1	0	13	51,617
Finney	3	1	0	2	14,660
Ford	3	0	0	3	15,689
Geary	1	0	0	1	3,365
Gove	10	3	0	7	45,873
Graham	74	9	0	65	282,366
Gray	1	0	0	1	6,335
Greenwood	12	2	0	10	23,317
Harvey	14	0	1	13	47,914
Haskell	1	0	1	0	2,760
Hodgeman	17	1	0	16	81,433
Jefferson	1	0	0	1	2,270
Kingman	23	7	0	16	103,901
Kiowa	1	0	0	1	4,973
Lane	3	0	0	3	15,029
Lyon	5	0	0	5	11,989
McPherson	16	0	1	15	53,825
Marion	12	0	0	12	34,953
Marshall	5	0	0	5	12,357
Meade	6	1	2	3	39,165
Morris	7	0	0	7	17,369
Morton	1	1	0	0	6,000
Nemaha	4	0	0	4	12,516
Ness	10	0	0	10	45,801
Norton	17	0	0	17	64,062
Osage	3	0	2	1	5,522
Osborne	2	0	0	2	7,540
Pawnee	12	1	1	10	48,684
Phillips	40	10	0	30	133,977
Pottawatomie	10	0	0	10	25,670
Pratt	9	0	0	9	42,440
Rawlins	2	0	0	2	6,495
Reno	18	2	0	16	72,093
Rice	29	2	0	27	99,989
Riley	2	0	0	2	5,171
Rooks	62	12	0	50	224,948
Rush	13	1	0	12	48,690
Russell	20	1	0	19	66,972
Saline	26	5	0	21	91,537
Scott	5	1	0	4	22,216
Sedgwick	22	5	0	17	73,628
Seward	3	2	1	0	20,814
Shawnee	3	0	0	3	7,326
Sheridan	2	0	0	2	8,606
Smith	1	0	0	1	4,176
Stafford	71	17	1	53	269,966
Sumner	20	4	0	16	80,486
Thomas	2	0	0	2	9,814
Trego	37	3	0	34	153,204
Wabaunsee	9	2	0	7	29,549
Woodson	3	1	0	2	5,101
Total	1,006	139	12	855	3,659,659

KANSAS

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Allen-Robinson	8	3	0	5	21,899
Ames	7	5	0	2	23,637
Atherton	8	4	0	4	26,690
Augusta	10	9	0	1	25,330
Barry	11	8	0	3	38,057
Bartholomew	18	13	0	5	58,056
Bass	6	1	0	5	23,345
Beaver, NW.	7	4	0	3	26,605
Bemis-Shutts	19	10	0	9	68,371
Berland	32	26	0	6	121,527
Berland, SW.	8	3	0	5	30,429
Bernard	10	9	0	1	33,851
Big Creek	13	10	0	3	41,881
Blankenship	6	5	0	1	15,624
Box	6	4	0	2	17,766
Boyd	17	12	0	5	58,892
Broadway	22	19	0	3	84,950
Bryant	14	8	0	6	47,621
Burnett	12	10	0	2	42,544
Burrton	12	8	0	4	41,706
Carmi	6	4	0	2	25,910
Chance	38	34	0	4	169,512
Chandler	9	9	0	0	31,530
Chase	44	31	0	13	142,204
Cheyenne View	35	28	0	7	119,647
Cooper	42	29	1	12	161,912
Covert-Sellers	28	22	0	6	67,605

Field—	Comp.	Oil	Gas	Dry	Footage
Dewey	14	8	1	5	53,828
Douglas	8	3	0	5	18,537
Dreiling	7	6	0	1	23,848
Dresden	21	18	0	3	85,870
Duggin	10	8	0	2	35,606
Eden Valley	6	4	0	2	22,542
Edwards	7	2	0	5	23,281
Edwards, N.	40	33	0	7	130,759
Elbing	7	5	0	2	17,263
El Dorado	64	58	0	6	166,285
Emmeram, NE.	10	5	0	5	35,351
Eureka	8	5	0	3	16,399
Eveleigh	6	3	0	3	20,403
Fairport	10	3	0	7	33,921
Fall Creek	21	19	0	2	99,655
Fankhouser	9	5	0	4	16,996
Forest Hill	20	14	0	6	66,051
Four-Mile Creek	10	2	1	7	31,184
Fox-Bush	11	4	0	7	31,237
Frey	10	5	0	5	37,827
Fort Zarah	51	46	0	5	172,999
Geneseo	41	22	0	19	135,457
Georob	6	2	0	4	16,755
Gorham	21	13	0	8	68,520
Gra-Rook	16	12	0	4	52,130
Grow	11	6	0	5	41,236
Hall-Gurney	56	43	1	12	146,420
Hamilton	11	10	0	1	19,478
Hammer, N.	18	12	0	6	61,894
Hartenbower	6	2	0	4	15,636
Hazel, W.	9	6	0	3	33,229
Hazlett	28	20	0	8	70,388
Hazlett, N.	7	6	0	1	17,391
Hickman	15	12	0	3	56,927
Hoagland	10	9	0	1	16,349
Huffstutter	58	0	6	52	203,316
Hugoton	355	0	344	11	908,398
Iuka	23	22	0	1	98,239
Kowalsky, NW.	7	3	0	4	23,705
Kraft-Prusa	67	48	0	19	237,756
Kramer-Stern	10	8	0	2	30,451
Larkin	6	4	0	2	21,060
Law	15	10	0	5	62,967
Leoville	18	9	0	9	62,338
Lost Springs	13	6	0	7	31,104
Lynd	10	6	0	4	37,705
Marcotte	23	21	0	2	87,212
Mary Ida	19	16	0	3	62,793
Mathews	10	8	0	2	32,911
Max	16	9	0	7	58,356
Morel	35	25	0	10	133,758
Morlan	10	7	0	3	37,807
Muddy Creek	6	3	0	3	17,334
Mueller	11	7	0	4	39,806
Munyon	8	4	0	4	26,577
Nettie	10	9	0	1	35,458
Newbury	7	6	0	1	20,191
Northhampton	6	2	0	4	23,111
Odessa	6	4	0	2	19,408
Ogallah	16	15	0	1	64,288
Otis-Albert	7	4	1	2	25,247
Palco	9	8	0	1	34,874
Palco, SE.	6	4	0	2	23,412
Pawnee Rock, W.	10	8	0	2	37,898
Pleasant Ridge	11	4	0	7	40,907
Plum Creek	6	3	0	3	19,982
Potwin	20	15	0	5	55,053
Prairie View	9	4	0	5	30,476
Propp	7	2	2	3	17,154
Pundsack	17	10	0	7	63,893
Purdyville	6	4	0	2	29,130
Quincy	6	2	0	4	9,788
Rahn, NE.	7	4	0	3	20,747
Ray	10	9	0	1	36,011
Raymond	7	0	0	7	22,631
Rer Wing, NW.	7	4	0	3	27,051
Reynolds-Shaeffer	7	4	0	3	21,860
Rhodes	10	10	0	0	45,747
Richardson	7	3	0	4	23,672
Rick	4	1	0	3	13,518
Roesler	10	8	0	2	33,533
Russell	9	4	0	5	29,772
Russell, NE.	11	8	1	2	35,581
Ryan	8	5	0	3	30,540
Ryding	12	11	0	1	41,368
Semisch	8	6	0	2	22,657
Seward	8	7	0	1	21,164
Silica	32	21	0	11	105,545
Silica, S.	6	4	0	2	19,778
Smallwood	9	8	0	1	34,174
Smock-Sluss	8	2	0	6	22,824
Smolan	51	44	0	7	174,977
Smyres	7	7	0	0	23,526
Solomon	18	14	0	4	63,831
Solomon, NE.	19	17	0	2	66,367
Stafford	7	6	0	1	26,536
Stayton	8	5	0	3	25,606
Stoltenberg	21	14	0	7	69,649
Stuttgart	8	7	0	1	27,087
Sugarloaf	9	5	0	4	33,172
Syms	8	4	0	4	28,799
Teeter	11	8	0	3	26,482
Thrall-Agard	10	9	0	1	22,537
Three-Mile Creek	6	3	0	3	13,550
Toulon	6	3	0	3	21,409
Towanda	9	7	0	2	22,889
Trapp	78	58	0	20	253,289
Union, E.	7	5	0	2	23,315
Van Noy	14	10	0	4	24,489
Virgil	23	17	0	6	39,945
Virgil, N.	18	16	0	2	34,150
Walz	15	10	0	5	56,015
Walters	13	4	0	9	51,838
Webster	6	4	0	2	20,649
Weide	7	7	0	0	11,095
Wherry	7	2	0	5	23,838
Wherry, N.	7	5	0	2	24,199
White Cotton	10	6	0	4	28,906
Whitewater	14	5	0	9	37,364
Winterscheid	14	9	0	5	23,820
Zenith-Peace Creek	7	2	0	5	22,848
Miscellaneous	945	527	6	412	3,207,023
Total	3,495	2,038	364	1,093	11,374,971

MISSOURI
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	8	0	0	8	5,491
April	4	0	2	2	1,784
July	2	0	0	2	1,840
September	4	0	0	4	2,564
Total	18	0	2	16	11,679

MISSOURI
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	3	0	0	3	3,315
July	2	0	0	2	1,840
September	4	0	0	4	2,564
Total	9	0	0	9	7,719

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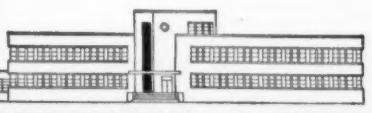

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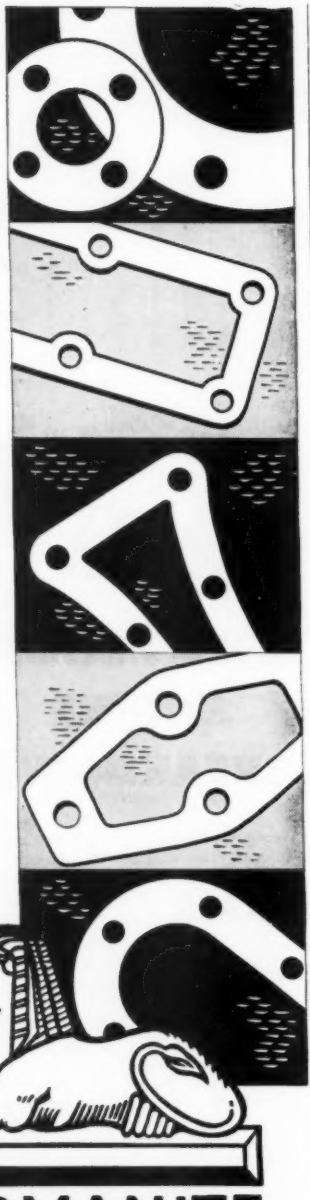

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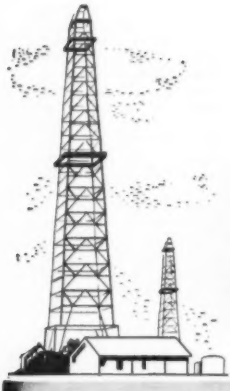

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MISSOURI
Development Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	5	0	0	5	2,176
April	4	0	2	2	1,784
Total	9	0	2	7	3,960

IOWA
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
February	1	0	0	1	2,505
July	1	0	0	1	2,057
Total	2	0	0	2	4,562

*No development completions.

IOWA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Harrison	1	0	0	1	2,057
Mills	1	0	0	1	2,505
Total	2	0	0	2	4,562

EASTERN AND SOUTH CENTRAL NEBRASKA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	21	13	0	8	55,730
February	11	5	0	6	30,265
March	10	2	0	8	28,592
April	5	1	0	4	12,328
May	6	3	0	3	15,082
June	3	1	0	2	9,618
July	3	0	0	3	9,232
August	6	2	0	4	17,463
September	5	3	0	2	13,986
October	0	0	0	0	0
November	4	1	0	3	13,008
December	5	2	0	3	13,947
Total	79	33	0	46	219,251

EASTERN AND SOUTH CENTRAL NEBRASKA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	7	0	0	7	21,485
February	4	0	0	4	13,163
March	6	0	0	6	18,711
April	1	0	0	1	2,420
May	3	0	0	3	7,660
June	2	0	0	2	7,218
July	1	0	0	1	3,557
August	3	0	0	3	9,497
September	2	0	0	2	6,258
October	0	0	0	0	0
November	3	0	0	3	10,856
December	3	0	0	3	9,167
Total	35	0	0	35	109,992

WEST NEBRASKA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	8	3	2	3	38,213
February	9	4	3	2	38,052
March	16	2	1	13	74,692
April	8	0	1	7	36,328
May	13	7	1	5	65,146
June	11	5	0	6	55,910
July	10	3	0	7	85,799
August	9	3	0	6	46,940
September	19	6	0	13	89,694
October	16	4	1	11	85,673
November	23	5	1	17	107,780
December	20	2	3	15	100,039
Total	162	44	13	105	824,266

WEST NEBRASKA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	0	1	3	17,496
February	4	2	0	2	17,845
March	8	0	0	8	36,034
April	6	0	0	6	26,545
May	5	2	0	3	25,309
June	3	0	0	3	16,701
July	6	0	0	6	67,880
August	8	2	0	6	40,826
September	13	2	0	11	64,018

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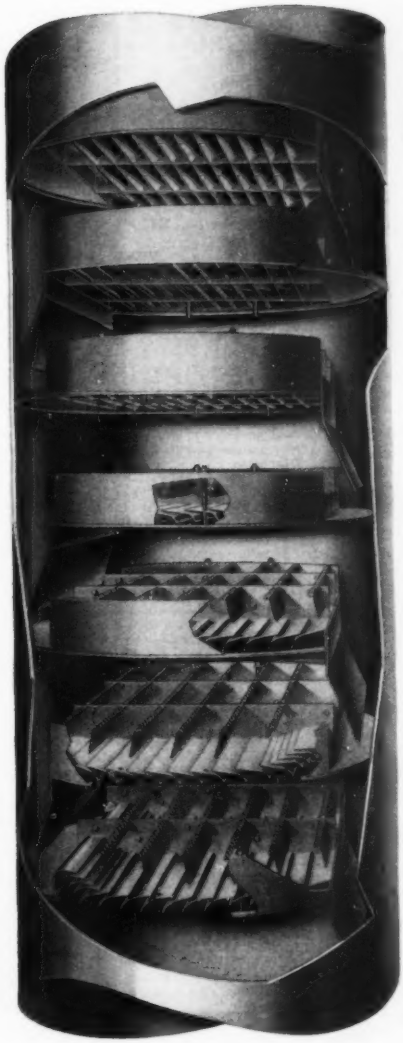

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Month—	Comp.	Oil	Gas	Dry	Footage
October	11	1	1	9	60,198
November	16	2	0	14	77,370
December	15	1	1	13	76,629
Total	99	12	3	84	526,851

WEST NEBRASKA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Banner	6	1	0	5	37,458
Box Butte	2	0	0	2	9,143
Chase	1	0	0	1	4,035
Cheyenne	40	7	1	32	219,873
Dawes	3	0	0	3	8,319
Dawson	1	0	0	1	3,788
Deuel	7	0	2	5	28,026
Furnas	1	0	0	1	3,848
Garden	3	0	0	3	14,972
Grant	1	0	0	1	4,874
Hayes	1	0	0	1	4,266
Keith	2	0	0	2	6,480
Kimball	11	4	0	7	80,547
Morrill	7	0	0	7	38,464
Perkins	3	0	0	3	12,417
Scottsbluff	1	0	0	1	5,201
Sheridan	5	0	0	5	18,975
Sioux	4	0	0	4	26,165
Total	99	12	3	84	526,851

WEST NEBRASKA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Big Springs	8	0	5	3	27,487
Big Springs, W.	2	0	2	0	7,036
Brownson, E.	2	0	0	2	9,840
Dalton	4	1	0	3	19,294
Dorman	7	7	0	0	33,638
Gurley	9	7	0	2	40,044
Harrisburg	5	2	0	3	31,028
Huntsman	21	13	3	5	101,863
Kimball	2	1	0	1	13,077
Marlowe	3	1	0	2	14,108
Total	63	32	10	21	297,415

COLORADO
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	19	5	2	12	68,809
February	11	4	0	7	58,777
March	18	10	1	7	86,462
April	22	7	1	14	103,811
May	14	7	1	6	67,752
June	27	11	0	16	139,381
July	18	5	1	12	93,568
August	20	8	0	12	97,362
September	38	17	2	19	191,018
October	34	9	2	23	166,937
November	24	10	0	14	115,958
December	44	10	2	32	234,676
Total	289	103	12	174	1,424,511

COLORADO
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	7	0	0	7	27,139
February	7	0	0	7	39,789
March	8	1	1	6	34,821
April	10	0	1	9	51,527
May	8	1	1	6	38,553
June	13	1	0	12	64,290
July	13	1	1	11	68,285
August	9	0	0	9	45,320
September	14	1	0	13	80,266
October	15	1	1	13	75,814
November	11	1	0	10	58,503
December	28	2	1	25	150,872
Total	143	9	6	128	735,189

COLORADO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Adams	2	0	1	1	11,186
Archuleta	3	0	0	3	11,930
Alamosa	1	0	0	1	2,428
Boulder	1	0	0	1	4,662
Bent	1	0	0	1	5,895
Crowley	1	0	0	1	4,710
Douglas	1	0	0	1	9,670
Dolores	1	0	0	1	6,502
El Paso	2	0	0	2	8,768
Elbert	4	0	0	4	21,326
Fremont	1	0	0	1	483
Garfield	1	0	1	0	8,904
LaPlata	3	0	1	2	8,552
Larimer	2	0	0	2	5,627
Logan	43	7	1	35	219,146
Lincoln	1	0	0	1	3,816
Mesa	2	0	0	2	2,347
Montezuma	4	0	0	4	30,777
Morgan	17	1	0	16	105,163
Moffat	6	0	1	5	35,174
Montrose	4	0	0	4	20,680
Otero	1	0	0	1	3,316
Phillips	5	0	0	5	21,284
Rio Blanco	3	0	1	2	10,880
Washington	10	0	0	10	54,668
Weld	10	1	0	9	85,504
Yuma	13	0	0	13	31,991
Total	143	9	6	128	735,189

COLORADO
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Boulder	4	0	0	4	9,116
Buckingham	2	2	0	0	14,032
Chromo	7	2	0	5	6,429
Eskdale	2	0	0	2	10,737
Graylin	9	6	0	3	45,896
Hiawatha, E.	4	3	0	1	14,675
Ignacio	7	0	3	4	25,082
Loveland	3	0	2	1	8,573
Merino	12	10	0	2	61,535
Messex	6	1	0	5	31,147
Mount Hope	27	24	0	3	137,202
Powder Wash	2	2	0	0	11,053
Red Mesa	2	0	0	2	7,253
Sand Creek	4	2	0	2	20,833
Walker	11	7	0	4	55,493
Yenter	33	31	0	2	172,883
Miscellaneous	11	4	1	6	54,381
Total	146	94	6	46	689,322

MONTANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	14	12	0	2	26,989
February	10	8	0	2	25,500
March	14	10	0	4	31,379
April	16	11	0	5	31,288
May	13	7	0	6	29,428
June	26	17	0	9	60,500
July	18	10	2	6	46,026
August	26	17	1	8	56,750
September	26	11	0	15	75,808
October	22	11	2	9	42,354
November	44	20	3	21	120,099
December	33	10	0	23	94,020
Total	262	144	8	110	640,141

MONTANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	2,560
February	1	0	0	1	4,235
March	2	0	0	2	3,525
April	1	0	0	1	3,718
May	2	0	0	2	7,375
June	6	0	0	6	22,300
July	2	0	0	2	7,272
August	4	0	0	4	14,603
September	6	0	0	6	17,422
October	5	0	0	5	9,255
November	10	0	0	10	36,187
December	10	1	0	9	35,765
Total	50	1	0	49	164,217

MONTANA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Blaine	6	0	0	6	19,516
Carbon	1	0	0	1	1,464
Chouteau	2	0	0	2	5,155
Dawson	1	1	0	0	10,518
Fallon	1	0	0	1	2,012
Fergus	7	0	0	7	13,212
Garfield	1	0	0	1	6,588
Glacier	2	0	0	2	7,438
Golden Valley	2	0	0	2	7,020
Hill	2	0	0	2	6,396
Liberty	3	0	0	3	8,254
Musselshell	1	0	0	1	4,070
Park	1	0	0	1	917
Petroleum	1	0	0	1	3,250
Pondera	4	0	0	4	7,961
Rosebud	2	0	0	2	6,675
Stillwater	1	0	0	1	4,943
Sweetgrass	2	0	0	2	12,715
Toole	3	0	0	3	7,674
Treasure	1	0	0	1	7,010
Wheatland	3	0	0	3	15,499
Yellowstone	3	0	0	3	5,930
Total	50	1	0	49	164,217

MONTANA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Agawam	4	0	0	4	8,261
Battle Creek	2	0	0	2	5,045
Big Wall	7	6	0	1	21,612
Bowes	15	12	0	3	47,037
Cat Creek	2	1	0	1	3,222
Cut Bank	25	6	6	13	70,348
Kevin-Sunburst	71	57	0	14	114,820
Pondera	67	54	0	13	137,807
Reagan Nose	2	2	0	0	7,492
Sumatra	2	0	0	2	11,115
Sumatra, NW.	2	1	0	1	10,692
Whitlash	4	2	1	1	9,586
Miscellaneous	8	2	1	5	28,887
Total	212	143	8	61	475,924

UTAH
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	0	0	4	10,360
February	2	0	0	2	1,750
March	3	1	0	2	8,601
April	2	0	0	2	11,940
May	1	0	0	1	12,518
June	2	0	0	2	10,117
July	3	1	0	2	17,042
August	3	1	0	2	24,141
September	4	2	0	2	25,699
October	4	0	0	4	17,905
November	7	1	1	5	46,736
December	4	2	0	2	26,637
Total	39	8	1	30	213,446

UTAH
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	0	0	4	10,360
February	2	0	0	2	1,750
March	3	1	0	2	8,601
April	2	0	0	2	11,940
May	1	0	0	1	12,518
June	2	0	0	2	10,117
July	1	0	0	1	910
August	3	1	0	2	24,141
September	2	0	0	2	14,369
October	4	0	0	4	17,905
November	6	0	1	5	40,813
December	2	0	0	2	15,021
Total	32	2	1	29	168,445

UTAH
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Carbon	2	0	1	1	16,907
Davis	1	0	0	1	3,270
Duchesne	3	1	0	2	22,354
Emery	2	0	0	2	10,036
Garfield	1	0	0	1	10,120
Millard	2	0	0	2	2,935
Salt Lake	1	0	0	1	1,919
San Juan	4	0	0	4	13,269
Uintah	10	1	0	9	62,047
Utah	1	0	0	1	1,978
Wasatch	3	0	0	3	17,864
Washington	1	0	0	1	5,496
Wayne	1	0	0	1	250
Total	32	2	1	29	168,445

UTAH
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Gusher	1	0	0	1	10,500
Red Wash	6	6	0	0	34,501
Total	7	6	0	1	45,001

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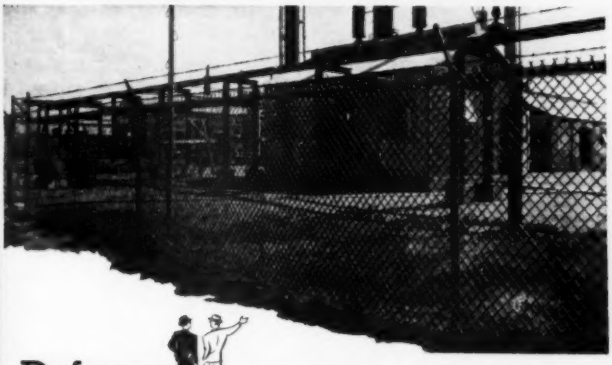

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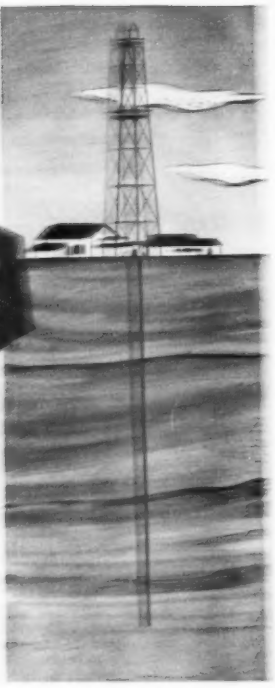

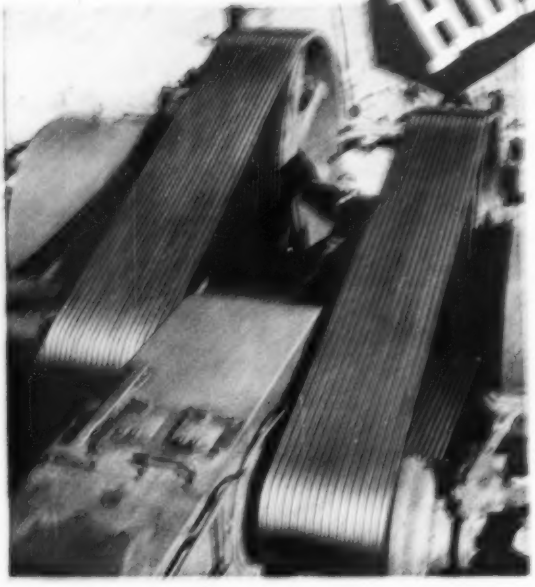

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V-Belts by **Dayton Rubber**

Since 1905

WORLD'S LARGEST MANUFACTURER OF V-BELTS

WYOMING

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	48	30	2	16	246,562
February	43	27	2	14	229,686
March	70	47	3	20	371,923
April	45	27	2	16	200,875
May	45	29	2	14	219,934
June	81	55	3	23	408,654
July	72	44	2	26	356,044
August	66	40	2	24	336,875
September	81	43	0	38	413,689
October	69	44	1	24	340,843
November	62	30	1	31	344,057
December	63	26	1	36	320,234
Total	745	442	21	282	3,789,376

WYOMING

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	4	1	0	6	38,219
February	11	3	1	7	52,265
March	13	5	0	8	68,628
April	5	0	0	5	23,503
May	7	0	0	7	42,041
June	11	3	0	8	65,352
July	5	1	0	4	19,748
August	12	0	1	11	44,188
September	30	5	0	25	150,478
October	11	0	0	11	55,175
November	12	1	0	11	58,619
December	17	2	0	15	78,460
Total	141	21	2	118	696,766

WYOMING

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Albany	2	0	0	2	15,333
Big Horn	14	3	0	11	56,636
Carbon	8	0	0	8	38,442
Campbell	2	0	0	2	15,787
Crook	2	0	0	2	7,251
Converse	10	2	0	8	70,411
Fremont	16	4	0	12	78,203
Goshen	1	0	0	1	7,661
Hot Springs	2	1	0	1	10,428
Johnson	23	5	1	17	124,209
Laramie	2	0	0	2	12,987
Lincoln	2	0	0	2	7,449
Park	7	2	0	5	35,241
Natrona	21	2	1	18	81,451
Niobrara	8	0	0	8	25,939
Platte	1	0	0	1	2,265
Sheridan	2	0	0	2	16,365
Sublette	2	1	0	1	20,779
Sweetwater	2	0	0	2	10,115
Uinta	4	0	0	4	19,911
Washakie	7	1	0	6	20,398
Weston	3	0	0	3	19,505
Total	141	21	2	118	696,766

WYOMING

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Beaver Creek	7	4	1	2	41,066
Big Muddy	5	3	0	2	23,333
Big Muddy E.	19	16	0	3	98,385
Bonanza	21	19	0	2	60,170
Byron S.	21	8	6	7	62,272
Church Buttes	3	0	2	1	38,826
Circle Ridge	19	17	0	2	25,599
Clareton	30	16	0	14	176,628
Cole Creek S.	17	11	0	6	160,791
Dallas	4	3	0	1	5,298
Elk Basin S.	3	2	0	1	17,675
Fiddler Creek	34	25	0	9	184,637
Frannie	17	17	0	0	60,799
Garland	13	11	1	1	55,606
Garland	3	3	0	0	13,980
Gebo	3	3	0	0	15,306
Glenrock	6	5	0	1	43,779
Glenrock area	3	1	0	2	22,272
Glenrock, S.	48	44	0	4	284,560
Grass Creek	10	10	0	0	40,250
Hay Creek	12	8	0	4	77,472
Hamilton Dome	6	6	0	0	19,509
Happy Springs	3	2	0	1	20,079
Horse Creek	5	5	0	0	27,561
Lake Creek, NW.	3	3	0	0	10,901
Lightning Creek	2	1	0	1	4,096
Little Buck Creek, S.	9	5	0	4	35,511
Meadow Creek	77	55	4	18	400,245

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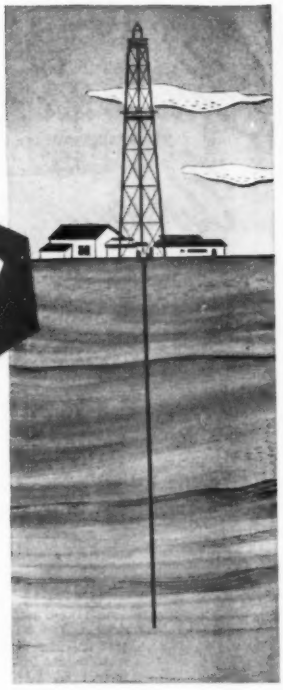

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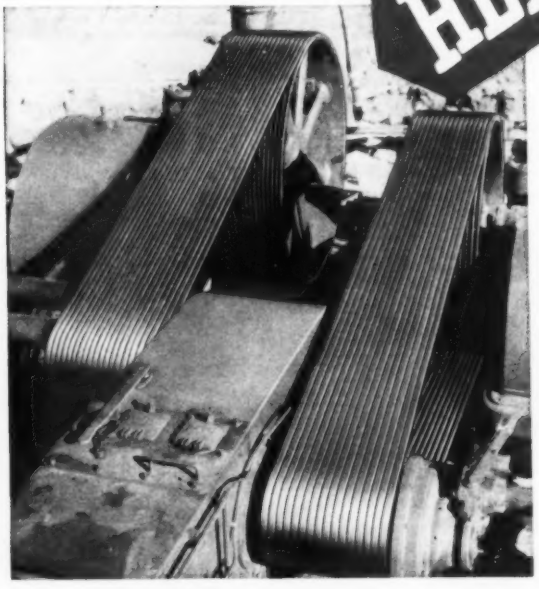

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V-Belts by **Dayton Rubber**

Since 1905

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WYOMING

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	48	30	2	16	246,562
February	43	27	2	14	229,636
March	70	47	3	20	371,923
April	45	27	2	16	200,875
May	45	29	2	14	219,934
June	81	55	3	23	408,654
July	72	44	2	26	356,044
August	66	40	2	24	336,875
September	81	43	0	38	413,689
October	69	44	1	24	340,843
November	62	30	1	31	344,057
December	63	26	1	36	320,234
Total	745	442	21	282	3,789,376

WYOMING

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	7	1	0	6	38,219
February	11	3	1	7	52,265
March	13	5	0	8	68,628
April	5	0	0	5	23,593
May	7	0	0	7	42,041
June	11	3	0	8	65,352
July	5	1	0	4	19,748
August	12	0	1	11	44,188
September	30	5	0	25	150,478
October	11	0	0	11	55,175
November	12	1	0	11	58,619
December	17	2	0	15	78,460
Total	141	21	2	118	696,766

WYOMING

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Albany	2	0	0	2	15,333
Big Horn	14	3	0	11	56,636
Carbon	8	0	0	8	38,442
Campbell	2	0	0	2	15,787
Crook	2	0	0	2	7,251
Converse	10	2	0	8	70,411
Fremont	16	4	0	12	78,203
Goshen	1	0	0	1	7,661
Hot Springs	2	1	0	1	10,428
Johnson	23	5	1	17	124,209
Laramie	2	0	0	2	12,987
Lincoln	2	0	0	2	7,449
Park	7	2	0	5	35,241
Natrona	21	2	1	18	81,451
Niobrara	8	0	0	8	25,939
Platte	1	0	0	1	2,265
Sheridan	2	0	0	2	10,365
Sublette	2	1	0	1	20,779
Sweetwater	2	0	0	2	10,115
Uinta	4	0	0	4	19,911
Washakie	7	1	0	6	20,296
Weston	3	0	0	3	19,505
Total	141	21	2	118	696,766

WYOMING

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Beaver Creek	7	4	1	2	41,066
Big Muddy	5	3	0	2	23,333
Big Muddy E.	19	16	0	3	98,385
Bonanza	21	19	0	2	60,170
Byron S.	21	8	6	7	62,272
Church Buttes	3	0	2	1	38,826
Circle Ridge	19	17	0	2	25,599
Clareton	30	16	0	14	176,628
Cole Creek S.	17	11	0	6	160,791
Dallas	4	3	0	1	5,298
Elk Basin S.	3	2	0	1	17,675
Fiddler Creek	34	25	0	9	184,637
Frannie	17	17	0	0	60,799
Garland	13	11	1	1	55,606
Garland	3	3	0	0	13,980
Gebo	3	3	0	0	15,306
Glenrock	6	5	0	1	43,779
Glenrock area	3	1	0	2	22,272
Glenrock, S.	48	44	0	4	284,560
Grass Creek	10	10	0	0	40,250
Hay Creek	12	8	0	4	77,472
Hamilton Dome	6	6	0	0	19,509
Happy Springs	3	2	0	1	20,079
Horse Creek	5	5	0	0	27,561
Lake Creek, NW.	3	3	0	0	10,901
Lightning Creek	2	1	0	1	4,096
Little Buck Creek, S.	9	5	0	4	35,511
Meadow Creek	77	55	4	18	400,245

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PIPE COUPLINGS AND FITTINGS

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Field—	Comp.	Oil	Gas	Dry	Footage
Manderson	4	2	0	2	17,670
Lost Soldier	3	2	0	1	20,148
Meadow Creek, N.	8	6	0	2	41,087
Mush Creek	12	5	1	6	48,888
Mush Creek, W.	5	1	0	4	25,805
Oregon Basin	10	8	0	2	41,165
Pilot Butte	4	3	0	1	22,514
Sage Spring Creek	12	7	0	5	82,695
Sage Spring Creek, N.	9	7	0	2	51,194
Salt Creek	4	4	0	0	10,499
Little Sand Draw	3	3	0	0	18,354
Skull Creek	11	4	0	7	38,963
Slick Creek	6	4	0	2	63,695
Steamboat Butte	7	7	0	0	49,364
Sussex	38	27	0	11	205,461
Teapot, E.	8	1	0	7	48,864
Worland	6	3	2	1	57,952
Miscellaneous	51	24	2	25	221,681
Total	604	421	19	164	3,092,610

NORTH DAKOTA
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
April	2	0	0	2	11,166
June	1	0	0	1	6,957
October	5	0	0	5	17,208
November	1	0	0	1	4,145
December	3	1	0	2	25,627
Total	12	1	0	11	65,103

*No development completions.

NORTH DAKOTA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Burleigh	1	0	0	1	6,957
Cavalier	4	0	0	4	11,825
Emmons	2	0	0	2	11,438
Kidder	1	0	0	1	5,610
Morton	1	0	0	1	7,790
Pierce	1	0	0	1	5,383
Stutsman	1	0	0	1	4,145
Williams	1	1	0	0	11,955
Total	12	1	0	11	65,103

SOUTH DAKOTA
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
November	1	0	0	1	2,528
Total	1	0	0	1	2,528

*No development completions.

SOUTH DAKOTA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Fall River	1	0	0	1	2,528
Total	1	0	0	1	2,528

IDAHO
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
March	1	0	0	1	12,844
Total	1	0	0	1	12,844

*No development completions.

IDAHO
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Oneida	1	0	0	1	12,844
Total	1	0	0	1	12,844

NEVADA
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
February	2	0	0	2	14,436
May	1	0	0	1	5,117
Total	3	0	0	3	19,553

*No development completions.

NEVADA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Elko	1	0	0	1	4,125
White Pine	2	0	0	2	15,428
Total	3	0	0	3	19,553

WASHINGTON
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
December	1	1	0	0	3,714

*No development completions.

WASHINGTON
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Grays Harbor	1	1	0	0	3,714

ARIZONA
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	1,555
July	1	0	0	1	2,517
Total	2	0	0	2	4,072

*No development completions.

ARIZONA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Apache	2	0	0	2	4,072

CALIFORNIA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	150	104	2	44	633,842
February	158	114	4	40	609,818
March	183	135	5	43	733,629
April	176	131	1	44	675,602
May	219	166	3	50	931,488
June	190	134	2	54	696,862
July	220	173	2	45	939,890
August	192	132	4	56	815,197
September	231	169	2	60	902,095
October	219	170	9	40	864,013
November	194	134	3	57	753,203
December	229	173	3	53	1,010,162
Total	2,361	1,735	40	*586	9,565,801

*Incl. 6 service wells.

CALIFORNIA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	36	3	0	33	167,458
February	35	4	1	30	108,117
March	41	6	0	35	148,559
April	41	4	0	37	207,413
May	44	4	0	40	203,627
June	46	5	0	41	175,224
July	51	9	0	42	217,392
August	52	4	1	47	225,167
September	59	9	2	48	246,566
October	39	8	0	31	155,027
November	51	3	1	47	180,784
December	56	8	1	47	270,569
Total	551	67	6	478	2,305,903

CALIFORNIA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Butte	4	0	2	2	13,718
Fresno	32	4	0	28	191,710
Kern	186	28	1	157	598,871
Kings	26	2	0	24	94,858
Los Angeles	64	13	0	51	353,218
Madera	3	0	0	3	9,860
Monterey	22	5	0	17	79,242
Orange	19	5	0	14	100,475
Riverside	4	0	0	4	4,714
Sacramento	4	0	0	4	17,874
San Benito	5	1	0	4	17,685
San Bernardino	4	0	0	4	8,398
San Joaquin	3	0	0	3	16,358
San Luis Obispo	49	0	0	49	216,439
San Mateo	4	0	0	4	22,123
Santa Barbara	46	3	0	43	230,531
Solano	9	0	0	9	48,195
Sutter	3	0	0	3	10,975
Tehama	2	0	1	1	6,100
Tulare	10	0	0	10	24,015
Ventura	33	6	0	27	163,219
Yolo	6	0	2	4	25,139
Miscellaneous	13	0	0	13	52,186
Total	551	67	6	478	2,305,903

CALIFORNIA
Development Completions by Fields

SAN JOAQUIN VALLEY—

Field—	Comp.	Oil	Gas	Dry	Footage
Antelope Hills	10	9	0	1	24,615
Antelope Hills, N.	7	7	0	0	17,243
Belridge, S.	27	23	0	4	28,315
Buena Vista	18	15	1	2	64,437
Coalinga, East-side	22	22	0	0	58,670
Coalinga, West-side	9	9	0	0	19,122
Coles Levee, N.	9	9	0	0	83,163
Cuyama, S.	63	58	2	3	274,866
Cymric	16	15	0	1	23,736
Edison	47	45	0	2	196,079
Elk Hills	86	86	0	0	422,473
Fruitvale	31	30	0	1	125,525
Gosford	6	4	0	2	48,844
Kern Front	12	10	0	2	29,240
Kern River	48	46	0	2	57,025
Lost Hills	18	17	0	1	84,716
McDonald	7	6	0	1	19,055
Midway-Sunset	93	82	3	8	214,287
Morales Canyon	9	8	0	1	40,602
Mountain View	6	4	0	2	27,625
Premier	11	11	0	0	26,291
Race Track Hill	7	6	0	1	26,776
Raisin City	18	17	0	1	93,663
Rio Vista	13	0	9	4	44,960
Riverdale	5	4	0	1	33,923
Round Mountain	12	12	0	0	20,170
Russell Ranch	17	15	0	2	50,690
Salt Creek	6	3	0	3	11,323
Tejon Ranch	6	6	0	0	23,436
Tejon Hills	38	31	0	7	23,009
Tunis Creek	25	23	0	2	32,833
Trico	5	0	3	2	16,722
Miscellaneous	66	44	12	10	311,034
Total	773	677	30	66	2,594,488

CALIFORNIA
Development Completions by Fields

COASTAL REGION—

Field—	Comp.	Oil	Gas	Dry	Footage
Aliso Canyon	14	13	1	0	73,848
Bardsdale	7	7	0	0	51,924
Cat Canyon, W.	43	40	0	3	228,891
Del Valle	26	22	1	3	174,905
Guadalupe	12	12	0	0	29,079
Honor Rancho	5	4	0	1	34,917
Lompoc	15	13	0	2	41,416
Newhall-Potrero	11	10	0	1	104,384
Orcutt	5	5	0	0	16,770
Placerita Canyon	68	65	0	3	114,794
Ramona	7	7	0	0	32,254
Rincon	5	5	0	0	39,145
San Ardo	158	157	0	1	349,997
San Miguelito	24	24	0	0	215,331
South Mountain	14	13	0	1	70,262
Tapo Canyon	8	3	0	5	14,747
Ventura Avenue	59	59	0	0	684,099
Zaca Creek	6	6	0	0	35,813
Miscellaneous	42	37	2	3	198,444
Total	529	502	4	23	2,511,020

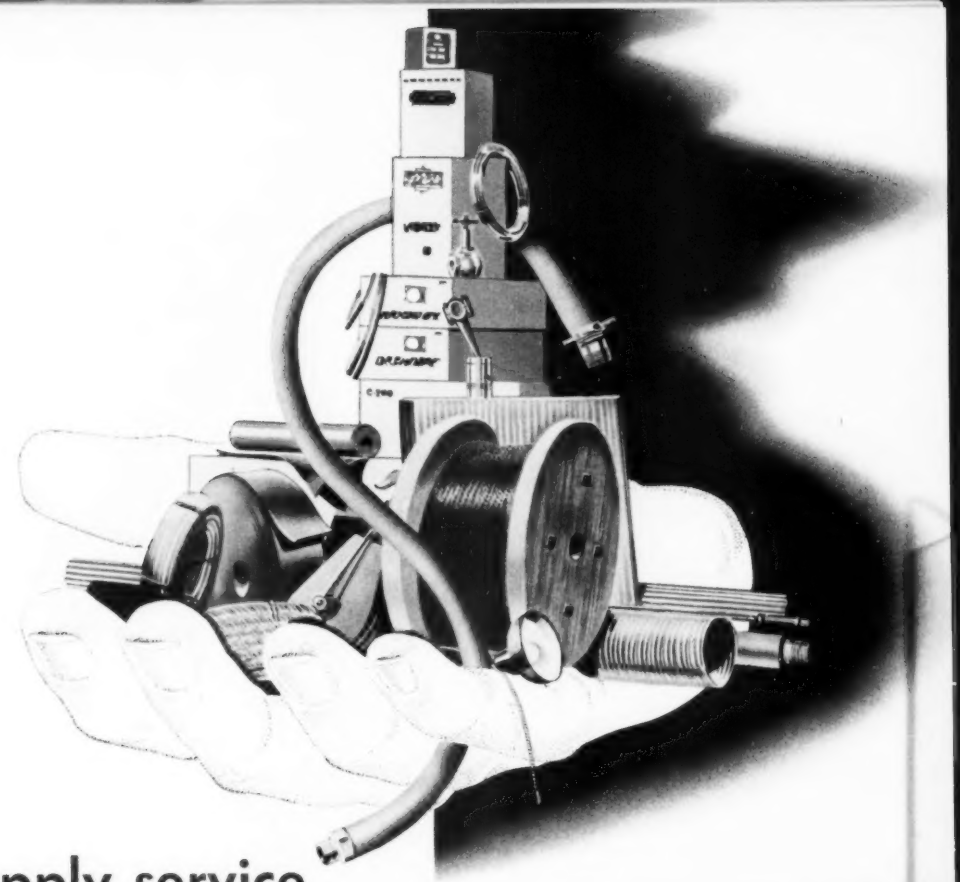
CALIFORNIA
Development Completions by Fields

LOS ANGELES BASIN—

Field—	Comp.	Oil	Gas	Dry	Footage
Brea-Olinda	25	23	0	2	138,206
Chino	9	6	0	3	13,760
Coyote, E.	20	19	0	1	119,801
Coyote, W.	14	14	0	0	60,731
Dominguez	5	4	0	1	38,959
Huntington Beach	90	87	0	3	423,003
Inglewood	14	13	0	1	51,590
Long Beach	39	35	0	4	224,018
Newport, W.	14	13	0	1	30,571
Richfield	14	13	0	1	57,036
Santa Fe Springs	19	18	0	1	101,470
Sansinena	15	15	0	0	64,497
Seal Beach	11	11	0	0	75,616
Torrance	12	12	0	0	52,000
Wilmington	195	195	0	0	638,733
Miscellaneous	12	11	0	1	64,399
Total	508	489	0	19	2,154,390
Total Calif.	1,810	1,668	34	108	7,259,898

MICHIGAN
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	48	16	3	29	118,618
February	45	16	1	28	113,548
March	74	25	3	46	191,072
April	47	13	2	32	115,094
May	56	12	2	42	143,605



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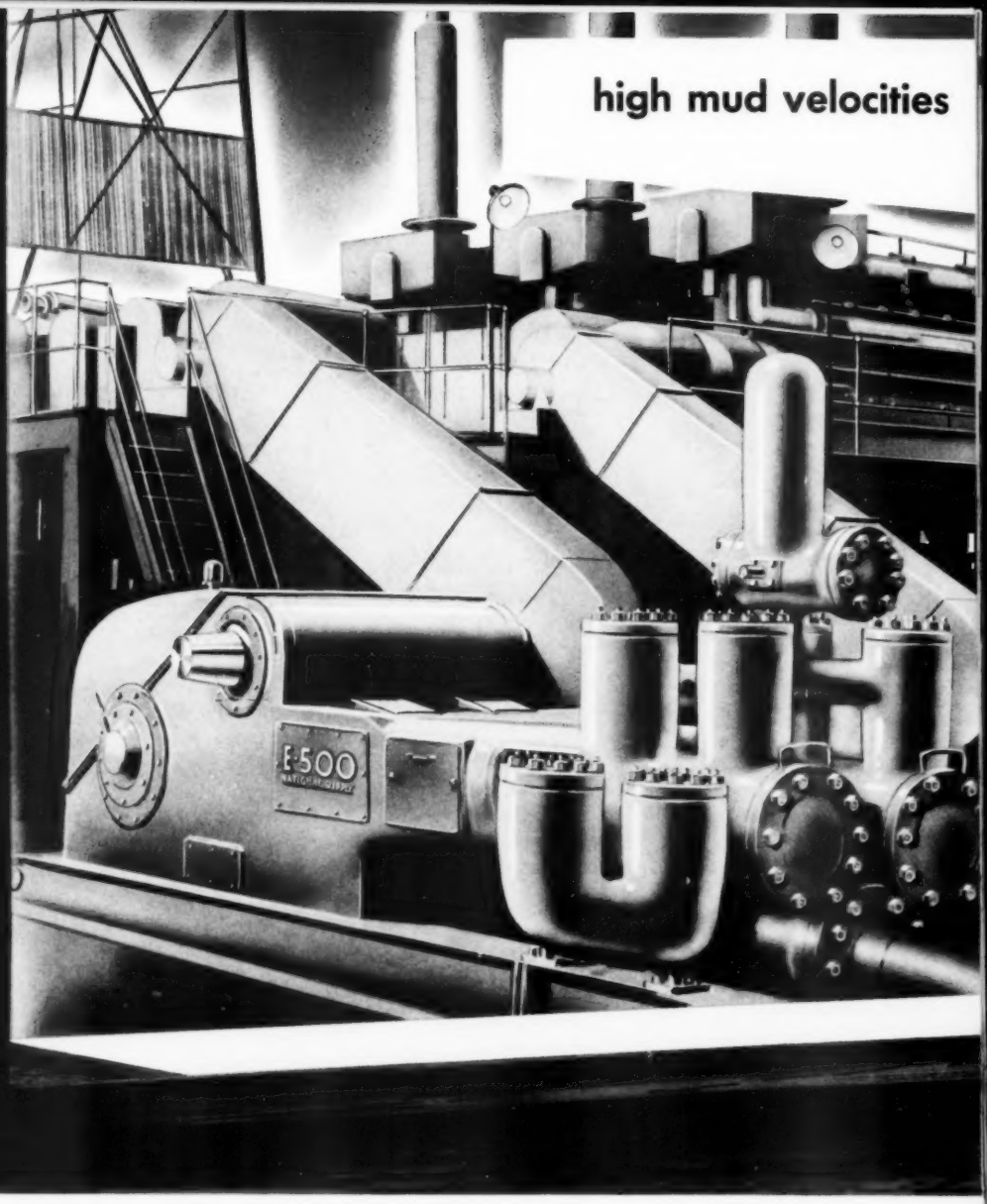

Now that heavier demands are being placed on pump capacity than ever before it's time to check up again on the complete National "Ideal" line of slush pumps.

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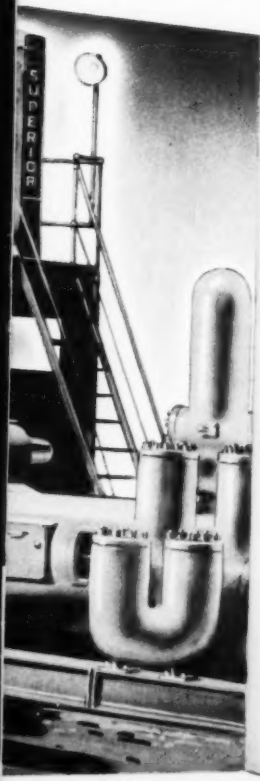

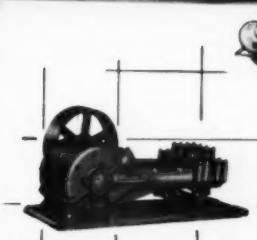

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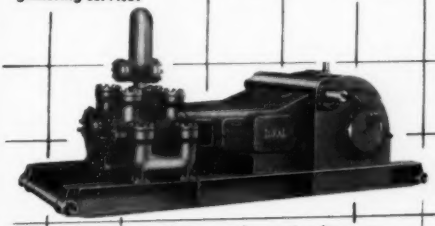

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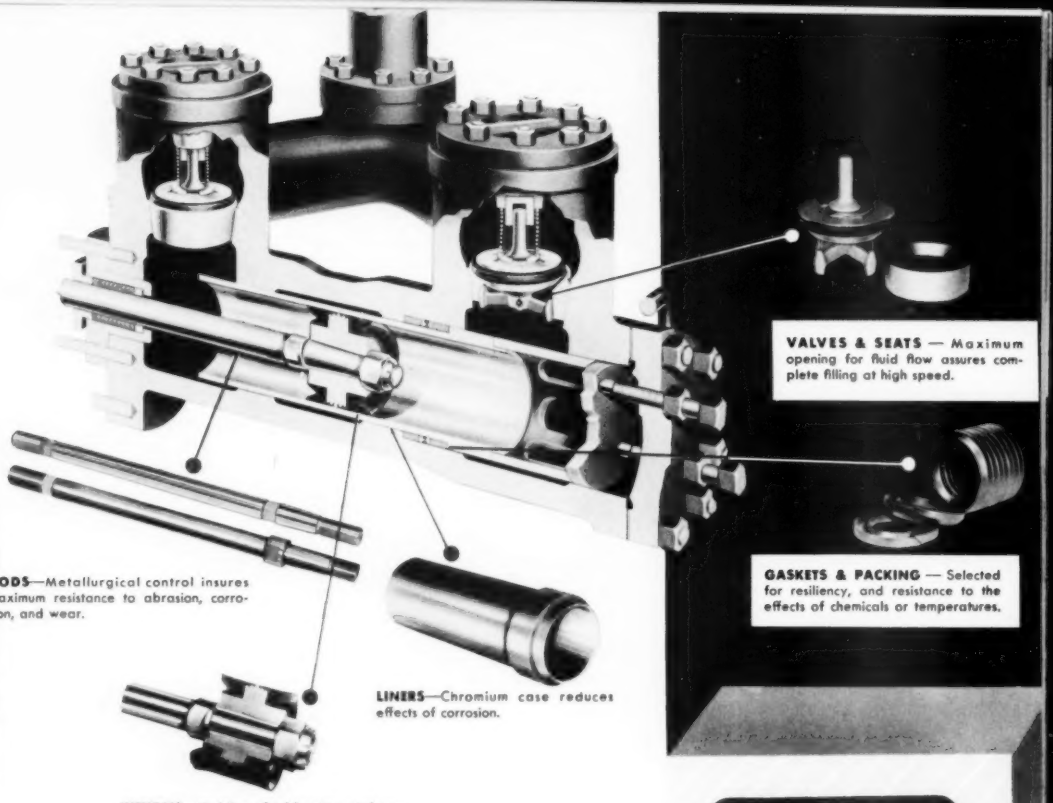
SPANG STEEL PIPE **SUPERIOR & ATLAS ENGINES** NATIONAL BLUE PRODUCTS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NATIONAL OIL FIELD MACHINERY AND EQUIPMENT · SPANG STEEL PIPE · SUPERIOR & ATLAS ENGINES

Month—	Comp.	Oil	Gas	Dry	Footage
June	89	24	3	62	226,350
July	74	21	0	53	167,275
August	88	24	4	60	201,320
September	55	18	0	37	132,997
October	58	11	1	46	140,089
November	70	22	1	47	185,034
December	42	21	0	21	125,662
Total	746	223	20	*503	1,860,664

*Incl. 46 gas storage wells.

MICHIGAN

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	19	0	1	18	41,035
February	19	0	1	18	41,298
March	34	3	1	30	85,830
April	26	1	0	25	56,743
May	32	1	0	31	80,627
June	36	2	1	33	85,746
July	28	2	0	26	60,299
August	33	1	1	31	70,242
September	27	1	0	26	56,580
October	30	0	0	30	74,197
November	30	2	0	28	76,305
December	18	6	0	12	48,576
Total	332	19	5	308	777,478

MICHIGAN

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Allegan	87	2	0	85	126,856
Antrim	2	0	0	2	4,157
Arenac	11	0	0	11	35,016
Barry	4	1	0	3	7,541
Bay	8	1	0	7	26,481
Charlevoix	2	0	0	2	2,285
Clare	6	1	0	5	22,575
Clinton	2	0	0	2	5,425
Gladwin	7	0	0	7	23,825
Gratiot	3	0	0	3	9,829
Huron	4	0	0	4	8,779
Ionia	3	0	0	3	9,170
Iosco	2	0	0	2	4,130
Isabella	10	0	0	10	35,321
Kalamazoo	2	0	0	2	2,618
Kalkaska	6	0	0	6	20,032
Kent	13	0	0	13	30,957
Lake	3	0	0	3	9,475
Livingston	3	0	0	3	6,828
Mason	5	0	0	5	11,115
Mecosta	15	1	2	12	51,895
Midland	5	2	0	3	19,099
Missaukee	6	0	0	6	28,355
Montcalm	14	1	1	12	37,592
Muskegon	11	0	1	10	19,799
Newaygo	15	2	1	12	37,674
Oceana	14	2	0	12	27,437
Ogemaw	9	4	0	5	35,628
Osceola	6	1	0	5	18,939
Otsego	2	0	0	2	7,471
Ottawa	7	0	0	7	11,914
Roscommon	5	1	0	4	13,291
Saginaw	3	0	0	3	7,215
Tuscola	4	0	0	4	10,052
Van Buren	24	0	0	24	27,944
Miscellaneous	7	0	0	7	18,480
Total	332	19	5	308	777,478

MICHIGAN

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Adams, all pools	6	2	0	4	22,188
Austin (gas storage)	18	0	0	18	25,020
Bard	3	3	0	0	11,816
Beaver Creek	11	9	0	2	48,370
Beaverton, all pools	4	1	0	3	15,702
Bentley	5	3	0	2	19,182
Billings—Dundee and sour	7	5	0	2	27,842
Bloomingdale	10	4	0	6	12,841
Cannon Creek Gas	5	0	4	1	14,327
Cedar Creek Gas	3	0	2	1	3,391
Clear Lake	7	5	0	2	9,912
Cranberry Lake (gas storage)	3	0	0	3	4,061
Croton	3	3	0	0	7,634
Crystal Valley	3	1	1	1	6,057
Custer Gas	6	0	0	6	6,890
Deep River	4	0	0	4	11,689
Dunningville	14	2	0	12	20,624
East Norwich	14	13	0	1	62,918
East Pullman	5	3	0	2	5,812
East Reed City	7	4	0	3	24,315
Egelston Gas	6	0	4	2	6,710
Enterprise	8	5	0	3	33,381
Geneva	14	4	0	10	14,806
Gibson	5	2	0	3	14,142
Heath	7	7	0	0	10,573
Home Gas	3	0	1	2	3,853
Kawkawlin	15	15	0	0	43,486
Lincoln (gas storage)	22	0	0	22	33,573
Lucht	4	1	0	3	8,997
Mears	4	3	0	1	7,603
Mineral Springs	6	3	0	3	23,315
North Fork	6	3	0	3	22,949
Pinconning	3	1	0	2	8,650
Rabbit River	4	3	0	1	6,697
Rose City	26	24	0	2	109,327
St. Helen	26	19	0	7	111,773
Shelby	4	2	0	2	7,540
Skeels	9	1	0	8	36,700
South Lee	3	0	0	3	3,571
Stanton	3	2	0	1	9,425
Sterling	3	3	0	0	8,443
Stony Lake	6	3	0	3	10,446
Trowbridge	7	5	0	2	9,571
Wayland	25	19	0	6	44,913
Winterfield (gas storage)	3	0	0	3	4,087
Miscellaneous	54	21	3	30	127,983
Total	414	204	15	195	1,083,186

ILLINOIS

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	262	113	2	147	610,741
February	133	74	0	59	345,374
March	96	34	1	61	217,618
April	135	56	0	79	338,215
May	222	73	0	149	562,694
June	232	73	0	159	596,807
July	281	97	0	184	721,365
August	250	100	0	150	604,778
September	242	88	0	154	630,759
October	231	94	4	133	553,220
November	188	63	3	122	487,002
December	152	53	0	99	375,288
Total	2,424	918	10	*1,496	6,043,861

*Incl. 12 service wells.

ILLINOIS

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	79	10	0	69	179,277
February	25	3	0	22	57,818
March	28	5	0	23	66,124
April	44	4	0	40	98,528
May	77	10	0	67	197,438
June	99	10	0	89	254,808
July	115	9	0	106	293,079
August	91	12	0	79	212,365
September	103	13	0	90	286,759
October	87	10	2	75	192,003
November	69	8	1	60	169,791
December	56	9	0	47	140,723
Total	873	103	3	767	2,148,713

ILLINOIS

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Bond	33	0	0	33	50,642
Christian	18	2	0	16	44,663
Clark	17	0	0	17	24,274
Clay	57	10	0	47	197,337
Clinton	61	2	0	59	119,234
Coles	14	0	0	14	14,856
Crawford	7	0	0	7	9,248
Cumberland	5	0	0	5	7,448
Douglas	4	0	0	4	2,676
Edgar	23	0	0	23	20,722
Edwards	28	4	0	24	89,189
Effingham	16	5	0	11	45,867
Fayette	37	0	1	36	73,045
Franklin	17	2	0	15	53,689
Gallatin	32	5	0	27	86,552
Hamilton	55	6	0	49	186,346
Jasper	14	1	0	13	38,121
Jefferson	28	4	0	24	75,438
Lawrence	20	1	0	19	44,906
Macon	5	0	0	5	11,297
Macoupin	9	0	0	9	6,239
Madison	36	0	1	35	37,380
Marion	28	3	0	25	61,494
Montgomery	17	1	0	16	24,387
Perry	8	0	0	8	17,127
Richland	57	12	0	45	182,246
Saline	10	1	0	9	28,305
Sangamon	4	0	0	4	6,957
Shelby	12	0	0	12	26,379
Wabash	21	8	0	13	50,693
Washington	20	4	0	16	47,344
Wayne	71	18	0	53	234,818
White	62	14	1	47	191,123
Miscellaneous	27	0	0	27	38,671
Total	873	103	3	767	2,148,713

ILLINOIS

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Aden South	9	5	0	4	30,667
Akin West	4	2	0	2	12,291
Albion Consolidated	34	21	0	13	83,850
Albion East	6	2	0	4	18,497
Allendale	20	8	0	12	36,125
Assumption N.	8	6	0	2	18,575
Bartelso East	7	5	0	2	18,371
Beaucoup S.	4	4	0	0	5,770
Beaver Creek	8	3	0	5	9,257
Beaver Creek S.	13	8	0	5	14,753
Bellmont	4	2	0	2	11,805
Bend	13	9	0	4	30,520
Benton North	4	1	0	3	11,450
Blairsville West	15	9	0	6	51,736
Bone Gap	4	1	0	3	10,230
Bone Gap S.	5	1	0	4	14,891
Bungay Consolidated	33	21	0	12	109,790
Cantrell	4	2	0	2	13,247
Cantrell North	6	3	0	3	19,937
Cantrell South	14	10	0	4	44,865
Casey	8	3	0	5	8,900
Centerville East	19	16	0	3	57,257
Clay City Noble Consolidated	111	64	0	47	337,169
Cottonwood N.	4	3	0	1	10,989
Dale Consolidated	71	41	0	30	225,840
Dubois	9	5	0	4	14,234
Dudley	6	3	0	3	2,416
Dundas East	19	14	0	5	57,254
Ellery West	36	24	0	12	119,536
Epworth Consolidated	10	5	0	5	28,090
Fairman	4	0	0	4	7,389
Frogtown N.	24	19	0	5	51,065
Goldengate Consolidated	25	16	0	9	85,788
Gossett	6	2	0	4	18,037
Half Moon	7	4	0	3	23,520
Herald	18	8	0	10	46,698
Hord	5	2	0	3	14,150
Hord South	6	2	0	4	17,059
Ingraham	29	20	0	9	88,020
Inman East	9	3	0	6	25,665
Inman West Consolidated	20	13	0	7	52,881
Iola Consolidated	5	1	0	4	14,282
Iola South	7	5	0	2	18,131
Irvington	6	2	0	4	10,012
Johnson North	6	3	0	3	4,429
Johnson South	7	5	1	1	4,504
Johnsonville W.	6	4	0	2	18,080
Keensburg S.	9	3	0	6	22,143
Keenville	10	9	0	1	30,759
King	4	1	0	3	11,550
Lawrence	47	22	0	25	78,255
Livingston	24	5	0	19	14,166
Livingston S.	14	9	0	5	7,966
Locust Grove	10	3	0	7	33,223
Long Branch	5	1	0	4	13,808
Louden	33	16	2	15	51,288
Main	44	27	0	17	47,205
Maplegrove E.	8	3	0	5	23,712
Marine	4	3	0	1	7,249
Markham City West	6	3	0	3	18,593
Martinsville	8	7	0	1	6,355
Mason North	9	7	0	2	22,724
Maunie North	10	7	0	3	29,728
Maunie South	10	4	0	6	24,799
Mitchell	7	4	0	3	23,507
New Harmony Consolidated	108	64	0	44	281,050
Olney South	5	0	0	5	16,117
Omaha	7	3	0	4	11,064

Field—	Comp.	Oil	Gas	Dry	Footage
Parkersburg	44	20	0	24	138,487
Patoka West	15	10	0	5	21,291
Phillipstown	55	36	0	19	158,595
Reservoir	5	2	0	3	13,270
Roland	17	10	0	7	49,913
Ruark	6	0	0	6	10,567
Sailor Springs Consolidated	21	11	0	10	59,734
Siggins	9	2	0	7	6,886
St. Paul	4	3	0	1	8,045
Stokes-Brownsville	4	1	0	3	12,404
Storms	27	24	0	3	63,846
Sumpter	5	2	0	3	14,265
Trumbull	4	1	0	3	10,877
Walpole	15	9	0	6	47,955
Walpole S.	6	1	0	5	19,798
Weaver	7	6	0	1	15,293
Westfield	9	5	0	4	4,243
Woburn Consolidated	7	1	0	6	6,401
Zenia East	4	3	0	1	10,850
Miscellaneous	207	57	4	146	519,143
Total	1,551	815	7	729	3,895,148

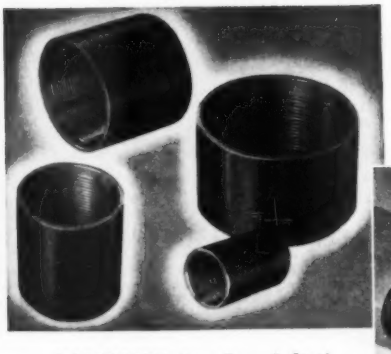
INDIANA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	102	34	5	63	172,812
February	64	21	1	42	104,455
March	54	16	2	36	98,419
April	83	28	0	55	155,662
May	90	24	0	66	155,378
June	146	59	1	86	264,471
July	130	41	3	86	239,820
August	148	54	2	92	266,293
September	186	51	3	132	336,043
October	159	41	0	118	285,942
November	118	37	1	80	215,598
December	89	28	0	61	159,779
Total	1,369	434	18	*917	2,454,672

*Incl. 5 service wells.

ACCURATE THREADING

...Key to the Dependability of HARRISBURG Couplings and Flanges



HARRISBURG Seamless Steel Pipe Couplings are manufactured to A.P.I. and A.I.S.I. specifications.

HARRISBURG Drop-Forged Steel Pipe Flanges are manufactured to A.S.A. standards.

THREAD ACCURACY and constant rigid inspection assure superior strength and endurance in *Harrisburg* Couplings and Flanges. Couplings are threaded on special machines to insure accuracy of form, height, angle, and lead. Flange threads are perfect in height, angle, taper, and gauging.

SEE OUR CATALOG IN THE COMPOSITE CATALOG

Consult our Oil Country Distributors or write Harrisburg for information

HOUSTON — Henry H. Paris, Distributor, Inc.
LOS ANGELES — Howard Supply Company
TULSA — W. C. Norris, Manufacturer, Inc. (Couplings only)

HARRISBURG STEEL CORPORATION
Harrisburg 6, Pennsylvania

Custom-Built Quality Products in Quantity
99 YEARS IN PENNSYLVANIA'S CAPITAL

INDIANA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	40	4	0	36	71,245
February	31	3	1	27	48,981
March	25	7	1	17	43,269
April	27	0	0	27	44,067
May	42	3	0	39	73,720
June	46	6	0	40	88,829
July	48	8	0	40	87,259
August	56	9	0	47	191,318
September	87	7	0	80	158,295
October	66	5	0	61	119,257
November	44	2	1	41	81,191
December	47	10	0	37	82,926
Total	559	64	3	492	1,000,357

INDIANA
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Boone	1	0	0	1	1,052
Carroll	1	0	0	1	977
Cass	1	0	0	1	1,010
Clark	1	0	0	1	1,400
Clay	9	1	0	8	15,447
Crawford	1	0	0	1	1,811
Daviess	48	7	0	41	60,271
Dubois	17	2	1	14	18,524
Elkhart	1	0	0	1	843
Floyd	1	0	0	1	1,730
Fountain	5	0	0	5	4,678
Gibson	66	11	1	54	131,930
Greene	7	0	0	7	6,161
Harrison	2	0	0	2	4,322
Jackson	2	0	0	2	671
Jasper	1	0	0	1	980
Jennings	1	0	0	1	1,480
Knox	107	13	0	94	175,565
Kosciusko	1	0	0	1	1,293
LaGrange	1	0	0	1	2,357
Lawrence	4	0	0	4	8,242
Marshall	5	0	0	5	2,763
Martin	1	0	0	1	400
Miami	3	0	0	3	3,085
Monroe	2	0	0	2	2,605
Montgomery	1	0	0	1	2,315
Owen	8	0	1	7	10,317
Perry	8	0	0	8	5,210
Pike	25	3	0	22	36,353
Posey	91	18	0	73	245,918
Putnam	2	0	0	2	4,448
Spencer	15	1	0	14	21,624
Sullivan	37	1	0	36	61,598
Vanderburgh	38	4	0	34	84,152
Vermillion	2	0	0	2	2,744
Vigo	28	1	0	27	52,214
Warren	1	0	0	1	858
Warrick	12	2	0	10	21,089
Washington	1	0	0	1	870
White	1	0	0	1	1,050
Total	559	64	3	492	1,000,357

INDIANA
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Armstrong	7	3	0	4	18,225
Bartlesville	7	4	0	3	12,419
Bufkin West	13	8	0	5	37,285
Caborn	19	7	0	12	37,616
Caborn South	4	0	0	4	10,869
Claypole Hills	23	19	0	4	44,523
College	4	1	0	3	11,006
Crunks South	4	3	0	1	8,994
Denning	9	2	0	7	7,167
Elnora	16	4	0	12	16,618
Fairbanks	14	9	0	5	29,994
Farmersville	10	7	0	3	17,394
Ford	6	4	0	2	14,087
Ford South	23	10	0	13	50,843
Griffin	31	16	0	15	67,279
Huntingburg	5	1	0	4	5,267
Lamott	13	7	0	6	30,406
Mackey, W.	11	3	0	8	20,068
Monroe City	12	2	0	10	20,657
Monroe City E.	10	5	0	5	15,319
Monroe City N.	35	16	0	19	54,695
Monroe City S.	14	8	0	6	19,901
Monroe City W.	38	22	0	16	60,698
Mt. Vernon	5	3	0	2	10,927
Mumford	12	9	0	3	29,549
New Harmony E.	8	2	0	6	17,379
Owensville E.	6	3	0	3	13,723
Owensville N.	12	1	0	11	28,323
Patoka E.	12	8	0	4	22,513
Peru	6	2	0	4	5,405

Field—	Comp.	Oil	Gas	Dry	Footage
Plainville	6	4	1	1	6,261
Saline City	5	1	0	4	7,767
Springfield	4	1	0	3	12,186
St. James	6	3	0	3	14,154
St. Phillips	12	3	0	9	23,021
St. Wendells	4	1	0	3	4,295
Stooker	10	5	0	5	18,884
Terre Haute E.	8	6	0	2	13,429
Trenton	28	10	7	11	28,461
Union-Bowman	103	46	2	55	152,595
Upton	9	7	0	2	20,420
Vienna	5	3	0	2	12,384
Warrenton E.	4	3	0	1	7,344
Washington	11	7	0	4	14,947
Welborn	46	30	0	16	112,444
Westphalia	5	1	0	4	4,775
Miscellaneous	155	50	5	100	261,599
Total	810	370	15	425	1,454,315

WESTERN KENTUCKY
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	74	40	0	34	126,145
February	26	13	0	13	43,369
March	48	25	0	23	66,746
April	55	24	1	30	84,621
May	108	46	0	62	188,422
June	118	51	0	67	194,582
July	93	38	0	55	159,019
August	107	51	1	55	185,140
September	133	58	0	75	248,795
October	122	48	0	74	207,248
November	88	30	1	57	147,448
December	83	32	0	51	145,271
Total	1,055	456	3	*596	1,796,806

*Incl. 1 service well.

WESTERN KENTUCKY
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	21	4	0	17	48,338
February	5	0	0	5	11,063
March	15	3	0	12	25,554
April	13	0	1	12	23,581
May	35	5	0	30	74,898
June	35	5	0	30	72,548
July	23	4	0	19	47,025
August	22	4	0	18	46,690
September	41	7	0	34	91,738
October	30	4	0	26	63,086
November	16	3	0	13	32,989
December	26	10	0	16	56,122
Total	282	49	1	232	593,632

WESTERN KENTUCKY
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Breckenridge	2	0	0	2	2,340
Butler	1	0	0	1	390
Crittenden	2	0	0	2	1,125
Daviess	41	3	1	37	64,270
Edmonson	1	0	0	1	1,605
Grayson	1	0	0	1	1,703
Hancock	4	1	0	3	3,561
Henderson	122	24	0	98	287,332
Hopkins	4	2	0	2	11,080
Logan	1	1	0	0	1,475
McLean	27	6	0	21	57,465
Muhlenberg	13	2	0	11	11,611
Ohio	11	0	0	11	9,527
Todd	1	0	0	1	2,241
Union	25	1	0	24	67,708
Webster	26	9	0	17	70,199
Total	282	49	1	232	593,632

WESTERN KENTUCKY
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Aetnaville	70	50	0	20	56,372
Bald Knob	25	18	0	7	54,101
Baskett	17	11	0	6	37,878
Beech Grove, E.	6	3	0	3	11,356
Bells Run	19	7	0	12	16,831
Birk City	35	17	0	18	55,857
Buford	7	1	0	6	6,457
Cleopatra	21	16	0	5	39,157
Comer	4	1	0	3	7,687
Croydon, E.	6	4	0	2	13,548
Curdsville	4	2	0	2	7,853
Euterpe	8	4	0	4	15,717

LEADING PUMPS HAVE

Manzel FORCE FEED LUBRICATORS

Oil refinery, showing Transit Pumps equipped with Manzel Model 25 Lubricators.

Why it Pays to Select Manzel Lubricators

THEY LENGTHEN THE LIFE OF MACHINERY
Perfectly engineered lubrication adds years of trouble-free service.

THEY NEVER FORGET
Fully automatic, they eliminate the human element.

THEY PREVENT "DOWN TIME"
Machinery is lubricated while in operation.

THEY PUMP AGAINST HIGH PRESSURES
Special models available for most requirements.

MANZEL Lubricators do their job more efficiently than a crew of expert oilers *ever* could. They never forget or make mistakes, they reach inaccessible spots, they *constantly* supply *exactly* the right amount of oil to each wearing point. Machinery operates with less attention—saving labor, saving oil, eliminating "down time", reducing mantenance costs.

Manzel Force Feed Lubricators are furnished as standard equipment on many of the leading makes of diesel, gas, and steam engines, compressors, pumps, and other heavy machinery. Or they can be installed on your present equipment. They may be synchronized by ratchet or direct lever drive, or operated by a separate electric motor.

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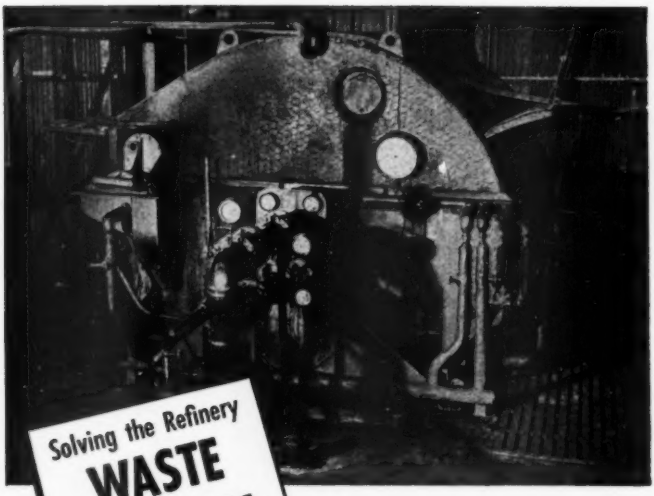

Solving the Refinery
WASTE DISPOSAL PROBLEM
. . . automatically, economically!

OLIVER PRECOAT FILTER

Trap residues—separator box emulsions—sludges . . . the Oliver Precoat Filter can effectively handle these wastes by dewatering sludges and breaking oil-water emulsions, resulting in stocks for refinery re-run and water ready for disposal in public streams. For example, a refinery is obtaining an oil phase carrying only 2/10 of 1% sludge and only a trace of water; the water phase is comparatively oil-free.

Oliver United engineers, calling on their 42 years of filtration experience and their many varieties of filter types, developed this closed type, continuous vacuum precoat filter for handling refinery wastes. It's proving a boon to refineries in connection with this vexing problem.

A letter or phone call to our nearest office will have a skilled refinery filtration engineer at your plant whenever desired to make a study and recommendations for a filtration plant to handle the wastes properly.

• • •

Another very profitable use of the Oliver Precoat Filter in refineries is in connection with contact clay handling. Many are in service providing continuous handling, great reduction in oil losses over other methods, and more easily handled cake.

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"Since 1857"

Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
3200 BELMONT AVE. CHICAGO 18, ILL.

Field—	Comp.	Oil	Gas	Dry	Footage
Fordsville	8	2	0	6	3,986
Glenville	15	5	0	10	25,876
Griffith	32	19	1	12	37,446
Guffie	37	25	0	12	76,854
Haynesville	9	3	0	6	3,229
Henderson, S.	8	6	0	2	15,412
Herbert	5	0	0	5	3,684
Hitesville	18	11	0	7	34,801
Huntsville	14	12	0	2	4,593
Little Zion	9	1	0	8	7,172
Lyonia	21	13	0	8	8,888
Morganfield, S.	19	14	0	5	40,642
Niagara	4	0	0	4	4,671
Pellville	13	5	1	7	10,327
Pleasant Ridge	9	2	0	7	8,896
Poole	14	7	0	7	27,905
Poole, W.	45	33	0	12	105,104
Pratt	36	28	0	8	67,985
Ralph	10	2	0	8	6,771
Red Hill	8	4	0	4	7,866
Reed	8	3	0	5	16,251
Reed, E.	5	0	0	5	9,246
Robards Consolidated	16	13	0	3	37,934
Russell School	5	0	0	5	5,574
Spottsville	9	3	0	6	20,636
Tilden, E.	4	1	0	3	8,490
Tucker Hollow	7	5	0	2	6,168
Tunnel Hill	8	5	0	3	16,833
Whitesville	5	1	0	4	4,075
Wyman	13	4	0	9	26,866
Zion,. N.	45	26	0	19	94,785
Miscellaneous	92	20	0	72	131,295
Total	773	407	2	364	1,203,174

EASTERN KENTUCKY

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	19	2	16	1	47,541
February	16	6	8	2	36,585
March	21	9	9	3	39,692
April	17	8	5	4	27,652
May	17	2	11	4	38,939
June	25	14	8	3	46,480
July	23	4	15	4	63,553
August	25	2	18	5	76,063
September	20	9	11	0	43,925
October	13	3	9	1	38,402
November	36	9	23	4	94,836
December	22	0	19	3	60,883
Total	254	68	152	34	614,951

EASTERN KENTUCKY

Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	1	0	0	1	1,425
March	1	0	0	1	525
April	3	0	0	3	5,126
May	1	0	0	1	2,300
June	1	0	0	1	1,600
July	1	0	0	1	1,180
August	1	0	0	1	1,547
November	2	0	0	2	3,217
Total	11	0	0	11	16,920

EASTERN KENTUCKY

Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Big Sandy	173	3	152	18	528,811
Big Sinking	12	11	0	1	11,620
Ida May	2	2	0	0	2,182
Isonville	4	4	0	0	3,989
Martha	24	24	0	0	20,400
Pilot	22	20	0	2	20,523
Springford	4	2	0	2	8,013
Miscellaneous	2	2	0	0	2,493
Total	243	68	152	23	598,031

OHIO

Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	92	36	20	36	208,864
February	42	14	11	17	98,363
March	80	25	18	37	176,384
April	67	25	10	32	126,278
May	62	18	17	27	124,047
June	77	26	22	29	155,680
July	112	49	21	42	212,649
August	91	24	24	43	211,803
September	95	30	19	46	208,585
October	86	32	22	32	181,505
November	88	26	24	38	180,678
December	79	29	18	32	172,742
Total	971	334	226	*411	2,057,578

*Includes 67 service wells.

OHIO

Wildcat Completions by Months

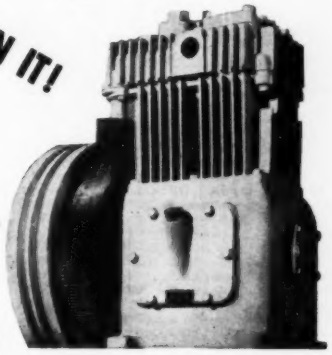
Month—	Comp.	Oil	Gas	Dry	Footage
January	6	1	0	5	19,691
February	2	0	2	0	7,641
March	5	0	1	4	14,937
April	3	0	0	3	11,498
May	0	0	0	0	0
June	3	0	1	2	9,602
July	1	0	0	1	2,460
August	3	0	1	2	12,775
September	4	0	0	4	15,129
October	3	0	1	2	11,512
November	2	0	0	2	6,685
December	3	0	1	2	11,443
Total	35	1	7	27	123,373

OHIO

Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Ashtabula	1	0	0	1	6,186
Belmont	1	0	0	1	2,901
Columbiana	1	0	0	1	6,193
Coshocton	1	1	0	0	3,146
Fairfield	1	0	0	1	3,267
Guernsey	1	0	0	1	3,466
Huron	1	0	0	1	1,965
Knox	1	0	0	1	2,729
Lorain	2	0	1	1	5,331
Medina	2	0	0	2	5,883
Meigs	1	0	0	1	4,280
Muskingum	1	0	1	0	3,676

SO MUCH DEPENDS ON IT!



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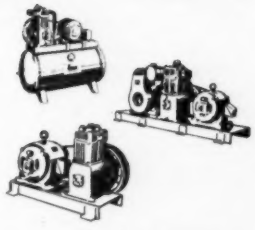
FOR DEPENDABLE

COMPRESSED AIR SUPPLY

When choosing a compressor, dependability is a big item to consider. Quincy Compressors have a reputation for delivering the required compressed air supply day in and day out. In addition, Quincy Compressors are modern . . . compact . . . rugged.

There's a Quincy Compressor for *your* job! Depend on a Quincy specialist to help you select the type and size (from 1 to 90 c. f. m.) to meet your specific needs. Write Dept. OG-4 for details.



ONLY QUINCY OFFERS ALL THESE FEATURES

- Timken Bearings
- Lynite Rods
- Perfectly Balanced Crankshaft
- Copper-Finned Intercooler
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QUINCY, ILLINOIS

Branch Offices: NEW YORK • PHILADELPHIA • CHICAGO • ST. LOUIS • DALLAS • SAN FRANCISCO

Quincy Manufactures Air Compressors Exclusively

County—	Comp.	Oil	Gas	Dry	Footage
Perry	3	0	1	2	11,241
Portage	1	0	0	1	4,364
Richland	6	0	2	4	14,679
Scioto	2	0	0	2	4,808
Stark	3	0	0	3	13,607
Summit	2	0	0	2	8,184
Tuscarawas	2	0	1	1	9,687
Washington	1	0	1	0	4,132
Wayne	1	0	0	1	3,648
Total	35	1	7	27	123,373

OHIO
Development Completions by Fields

Field—	Comp.	Oil	Gas	Dry	Footage
Ashland	281	86	74	121	479,068
Cambridge	172	55	44	73	219,007
Lancaster	153	51	28	74	397,606
Mount Vernon	212	117	22	73	579,839
Sandyville	24	0	14	10	111,839
Stewart	73	20	30	23	101,174
Others	21	4	7	10	46,272
Total	936	333	219	384	1,934,205

TENNESSEE
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	2,662
February	1	1	0	0	1,227
March	4	1	0	3	4,977
April	2	1	0	1	4,991
May	5	1	1	3	4,044
June	2	0	1	1	870
July	4	0	0	4	6,595
August	5	0	0	5	4,558
September	1	0	0	1	622
October	2	0	0	2	1,341
November	4	1	0	3	4,714
December	2	0	0	2	1,176
Total	34	5	2	27	37,777

TENNESSEE
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	0	2	2,662
February	0	0	0	0	0
March	3	0	0	3	3,937
April	1	0	0	1	3,761
May	5	1	1	3	4,044
June	2	0	1	1	870
July	4	0	0	4	6,595
August	4	0	0	4	3,558
September	1	0	0	1	622
October	2	0	0	2	1,341
November	3	0	0	3	3,464
December	2	0	0	2	1,176
Total	29	1	2	26	32,030

TENNESSEE
Wildcat Completions by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Clay	4	1	0	3	2,292
Cumberland	1	0	0	1	1,290
Fentress	3	0	0	3	4,864
Gibson	1	0	0	1	2,876
Hardeman	1	0	0	1	3,761
Montgomery	1	0	0	1	500
Morgan	3	0	0	3	4,381
Overton	2	0	0	2	3,055
Pickett	3	0	1	2	2,675
Putnam	2	0	1	1	1,090
Robertson	1	0	0	1	705
Stewart	1	0	0	1	740
Sumner	5	0	0	5	2,701
Wilson	1	0	0	1	1,100
Total	29	1	2	26	32,030

MARYLAND
Wildcat Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	2	0	2	0	7,275
February	1	0	1	0	3,522
March	3	0	3	0	12,082
April	1	0	1	0	3,488
May	3	0	3	0	10,635
June	5	0	4	1	21,400
July	4	0	3	1	15,623
August	4	0	1	3	17,052
September	6	0	1	5	26,842
October	2	0	1	1	8,347
November	7	0	3	4	29,117
December	7	0	5	2	29,318
Total	45	0	28	17	184,766

*No development completions.

NEW YORK
Development Completions* by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	34	17	0	17	49,000
February	30	16	0	14	43,500
March	44	22	0	22	64,000
April	52	26	0	26	75,000
May	62	41	0	31	87,000
June	72	37	0	35	104,100
July	65	33	0	32	94,000
August	73	37	0	36	105,500
September	51	26	0	25	72,500
October	66	34	0	32	95,500
November	44	23	0	21	64,500
December	34	18	0	16	48,500
Total	627	320	0	†307	903,100

*No wildcat completions. †Incl. 307 service wells.

WEST VIRGINIA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	55	6	38	11	153,217
February	54	6	35	13	159,745
March	48	6	35	7	131,402
April	34	3	24	7	101,876
May	51	7	28	16	153,754
June	40	6	26	8	111,738
July	50	10	32	8	146,210
August	54	3	39	12	158,714
September	59	9	38	12	158,063
October	71	9	50	12	193,721
November	66	8	44	14	187,240
December	40	6	30	4	113,361
Total	622	79	419	124	1,769,041

WEST VIRGINIA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	3	0	2	1	13,930
February	2	0	1	1	10,239
March	0	0	0	0	0
April	2	0	2	0	11,349
May	0	0	0	0	0
June	1	0	0	1	5,377
July	3	0	1	2	19,548
August	4	0	3	1	18,695
September	0	0	0	0	0
October	1	0	1	0	5,058
November	1	0	1	0	4,724
December	0	0	0	0	0
Total	17	0	11	6	88,920

PENNSYLVANIA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	97	38	29	39	190,870
February	79	35	14	30	137,680
March	120	52	20	48	214,315
April	137	61	24	52	243,563
May	160	71	25	64	309,132
June	184	86	23	75	305,883
July	162	74	19	69	313,426
August	175	82	18	75	281,940
September	175	85	12	78	281,408
October	171	74	29	68	322,624
November	136	64	13	59	223,536
December	142	54	22	66	303,290
Total	1,738	776	239	*723	3,127,667

*Incl. 653 service wells.

PENNSYLVANIA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	3	0	0	3	17,174
February	0	0	0	0	0
March	1	0	0	1	6,181
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	1	0	1	0	8,330
August	1	0	1	0	1,500
September	2	0	1	1	12,884
October	0	0	0	0	0
November	1	0	0	1	5,808
December	1	0	0	1	12,343
Total	10	0	3	7	64,220

NORTH CAROLINA
Wildcat Completions* by Counties

County—	Comp.	Oil	Gas	Dry	Footage
Hyde	1	0	0	1	3,125
Washington	2	0	0	2	6,250
Total	3	0	0	3	9,375

*No development completions.

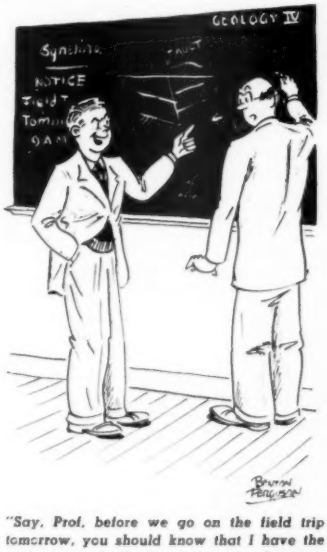
ALBERTA, CANADA
Total Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	102	78	2	22	391,689
February	82	65	2	15	361,206
March	78	48	5	25	338,256
April	64	48	2	14	314,195
May	91	60	12	19	392,479
June	105	65	6	34	441,481
July	105	65	10	30	455,904
August	124	77	9	38	499,287
September	128	72	23	33	500,737
October	126	65	12	49	547,976
November	140	83	12	45	618,818
December	89	42	16	31	357,857
Total	1,234	*766	111	355	5,220,085

*Incl. 6 distillate wells.

ALBERTA, CANADA
Wildcat Completions by Months

Month—	Comp.	Oil	Gas	Dry	Footage
January	20	1	2	17	87,384
February	12	0	2	10	62,256
March	28	1	5	22	136,057
April	14	0	2	12	76,174
May	22	3	7	12	109,769
June	36	1	5	30	149,872
July	27	1	6	20	107,591
August	35	2	1	32	151,284
September	29	6	2	21	135,352
October	46	4	5	37	199,927
November	38	3	4	31	169,885
December	38	4	7	27	154,514
Total	345	26	48	271	1,540,065



"Say, Prof, before we go on the field trip tomorrow, you should know that I have the entire area checkerboarded, and a lease on the exact spot where we'll be . . . it just so happens, too, that I have 10 acres of royalty offsetting this spot that I could turn loose for a song provided my grades are high enough!"

1951's New Pools and New Pays

Here are the wells that discovered new oil (new pools or new producing horizons in old pools) during 1951. A complete list of successful wildcats would include not only discovery wells but wells that extend old producing areas in previously proven horizons.

SOUTHWEST TEXAS

District 1

NEW POOLS

BORREGO CREEK—Wilson, July; M. L. Wise, et al., 1 Kate Higgins, Rafael Salinas Sur. 343, A-228, 5,590-5,632 ft., 328 bbl. of oil, TD 5,632 ft.

CEDAR CREEK, NORTH—Bastrop, January; John H. Foster 1 Mrs. Bessie Grohman, J. A. Navarro Sur., Serpentine 1,570-1,607 ft., 110 bbl. of oil, TD 1,607 ft.

COTULLA—La Salle, July; Henderson Coquat and O. R. Mitchell 1 Carlos Pena, I&GN Sur. 19, Blk. 2, A-897, Carrizo 2,214-18 ft., 36 bbl. of oil, TD 5,757 ft.

COUGHRAN—Atascosa, January; Lone Star Production Co. 1 Sarah E. Ferry, I&GN Sur., Sec. 1699, A-431, Edwards lime 8,208-30 ft., 128 bbl. of oil, TD 8,280 ft. 2 wells at year end.

DOERING, WEST—Frio, April; Humble Oil & Refining Co. B-1 Humble-Marrs McLean, BS&F Sur. 5, A-116, Navarro 4,155-70 ft., 39,300 M.c.f. of gas, TD 4,260 ft.

FENTRESS, EAST—Caldwell, April; A. W. Phillips 1 W. J. Richards et al., Andrew Churchill Sur., A-66, Austin chalk 1,615-1,747 ft., 30 bbl. of oil, TD 1,747 ft.

GOLDFINCH—Frio, March; Milam Drilling Co. 1 J. C. Cox, Albert Fisher Sur. 229, Navarro 4,617-30 ft., 63 bbl. of oil, TD 4,630 ft. 4 wells at year end.

GUY SMITH—Atascosa, November; B. F. Usery Sur., A-921, 2,204-07 ft., 129 bbl. of oil, TD 2,207 ft.

HINDES—Frio, January; Milam Drilling Co. 1 W. L. Pickens, Austin & Williams Sur. 694, A-10, Navarro 5,598-5,620 ft., 74 bbl. of oil, TD 5,620 ft. 4 wells at year end.

HOSTETTER—McMullen, July; Sunray Oil Corp. 1 A. M. Hostetter, Justo Conona Sur. 68, A-1122, Wilcox 10,088-10,114 ft., 6,000 M.c.f. of gas, TD 10,244 ft.

IMOGENE, SOUTH—Atascosa, June; Martin, Shelly & Thomas 1 Katie Richter, William Echols Sur. 1184, A-234, Carrizzo, 1,767-73 ft., 83 bbl. of oil, TD 1,903 ft. 10 wells at year end.

KYOTE—Atascosa, June; C. C. Dauchy and Miller Roy Co. 1 Jane Burns, Francis Oerelling Sur. 1336, A-654, Navarro 3,550-67 ft., 35 bbl. of oil, TD 3,567 ft. 3 wells at year end.

LOWE RANCH—McMullen, April; Newman Bros. Drilling Co. and Alaska Steamship Co. 1 Mrs. E. L. Craig, J. Poitevent Sur. 17, A-366, Wilcox 5,473-88 ft., 1,490 M.c.f. of gas, TD 6,246 ft.

MOSSER—Wilson, March; H. J. Mosser, et al, 1 Clarabel DeWiss Remschel, Manuel Barrera Grant, A-4, Buda lime, 7,715-7,805 ft., 560 bbl. of oil, TD 8,050 ft.

NEW SOMERSET—Bexar, March; Fred Scharf 1 August H. Ernst, Rolen League & Labor Sur. 48, A-617, 1,233-48 ft., 7 bbl. of oil, TD 1,248 ft.

PRUITT—Atascosa, April; Humble Oil & Refining Co. C-1 E. J. Pruitt, Fabrious Reynolds Sur. 51, A-719, Navarro, 4,930-64 ft., 12 bbl. of oil, TD 5,066 ft. 2 wells at year end.

RHODE RANCH - WILCOX—McMullen, January; Delhi Oil Corp. 1 D. W. Rhodes, F. M. Drake Sur. 178, A-867, Wilcox, 7,315-24 ft., no gage, TD 7,324 ft. 2 wells at year end.

RONNIE—Frio, August; Sid Katz 2 Simmons, B.S.&F. Sur. 19, A-143, Queen City, 880-87 ft., 6 bbl. of oil, TD 887 ft. 3 wells at year end.

STULTING—Gonzales, October; O. Neatherly, Jr., 1 Stulting, Robert Kelly Sur., A-307, Carrizo-Wilcox, 2,036-46 ft., 35 bbl. of oil, TD 2,046 ft. 2 wells at year end.

UNNAMED—Atascosa, January; McFarland Drilling Co. 5 Henrietta Krisch, et al, J. Durks Sur. 1207, Anacacaho lime, 3,559-69 ft., 126 bbl. of oil, TD 3,601 ft.

UNNAMED—Atascosa, December; J. D. Hedley 1 Charles Muil, Jorea C. Mattison Sur. 467, A-606, Carrizo-Wilcox, 2,668-77 ft., 34 bbl. of oil, TD 2,768 ft.

UNNAMED—Bexar, January; Pegg Bros. Drilling Co. 2 Pablo Verdeja, N. Montaya Sur., A-21, Navarro, 840-53 ft., 2 bbl of oil, TD 853 ft.

UNNAMED—Caldwell, July; Riddle Oil Co. 4 A. J. Miears, Nich Kelly Sur., 1,980-81 ft., 44 bbl. of oil, TD 2,163 ft.

UNNAMED—Caldwell, September; Southern Production Co. 1 Emil Willms, C. Crenshaw Sur., A-68, Edwards lime, 1,327-31 ft., 18 bbl. of oil, TD 1,364 ft.

UNNAMED—Frio, August; Goldston Oil Co. 1 Anna Witting, Dan Price Sur. 6, A-1026, Navarro, 3,682-725 ft., 11 bbl. of oil, TD 4,079 ft.

UNNAMED—Frio, September; Geo. W. Graham 1 T. P. Nowlin, John W. Crawford Sur., A-1080, 3,410-75 ft., 22 bbl. of oil, TD 3,475 ft.

UNNAMED—Frio, October; Forney & Winn 1 Marburger, Rusk T. Co. Sur. A-579, Navarro, 3,498-3,536 ft., 51 bbl. of oil, TD 3,536 ft.

UNNAMED—McMullen, March; Sunray Oil Corp. 1 J. E. Murphy, J. C. King Sur. 110, A-1134, Pettus, 3,061-65 ft., 16 bbl. of oil, TD 3,065 ft.

UNNAMED—McMullen, December; Newman Bros. & Alaska Steamship Co. 1-G South Texas Syndicate, James Fitzpatrick Sur., A-759, Lower Wilcox, 6,158-68 & 6,122-32 ft., 22,500 M.c.f. of gas, TD 6,350 ft.

UNNAMED—Milan, July; D. H. Byrd 1 M. Blakely, A. J. Watts Sur., Edwards lime, 5,736-39 ft., 20 bbl. of oil, TD 5,739 ft.

UNNAMED—Val Verde, May; R. J. Caraway 1 Mrs. Guida Rose, Sec. 2, GC&SF Sur., Strawn lime, 10,050-55, 10,067-75 & 10,085-100 ft., 34,000 M.c.f. of gas, TD 11,580 ft.

UNNAMED—Williamson, January; H. J. Stewart 1 Anna Rieger, Peter Cartwright Sur., Serpentine, 944-50 ft., 7 bbl. of oil, TD 960 ft.

NEW PAYS

BAKER—McMullen, August; W. Earl Rowe & P. R. Rutherford 2 Earl Baker, Seale & Morris Sur. 7, 1,824-36 ft., 8,000 M.c.f. of gas, TD 3,450 ft.

BORREGAS CREEK—Wilson, October; Martin, Shelly, Thomas & Wise 2 J. C. McCabe & Olmos, Rafeal Salinas Sur. 343, Austin chalk, 5,700-38 ft., 438 bbl. of oil, TD 6,004 ft.

JOURDANTON—Atascosa, November; Magnolia Petroleum Co. 3 Nixon & Steinle, John Neill Sur., A-641, Queen City, 785-93 ft., 9 bbl. of oil, TD 824 ft.

TEXAS GULF COAST

District 2

NEW POOLS

ALOE—Victoria, June; Fidelity Oil & Royalty Co. 1 Hulda Horadam, Manuel Zepeda Grant, A-128, Frio, 4,372-76 ft., gas, well, no gage, TD 4,600 ft.

BAACKE—DeWitt, October; Sunray Oil Corp. 1 Gus Baacke, Enoch Jones Sur., A-281, Slick-Wilcox, 7,577-86 ft., 4,400 M.c.f. of gas, TD 7,850 ft.

BEEVILLE, EAST—Bee, January; Bridwell Oil Co. 1 J. S. Hall, Anne Burk Sur., A-5, Vicksburg, 3,700-03 ft., 12,800 M.c.f. of gas, TD 4,473 ft. 2 wells at year end.

CANDLISH—Bee, July; O. Neathery, Jr. et al, 1 C. C. Diebel, Carman Molina Sur., A-39, Jackson Vicksburg, 4,463-64 ft., 66 bbl. of cond., TD 4,512 ft.

COLLIER—Jackson, January; J. M. Huber Corp. 1 William Classen, James Kerr Sur., Catahoula, 2,806-10 ft., 6,000 M.c.f. of gas, TD 3,359 ft.

CORDELE—Jackson, January; John B. Coffee 1 Sample-Appelt, Sylvester Bowen Sur., A-8, Frio, 4,686-91 ft., 1,000 M.c.f. of gas, TD 5,102 ft.

DePINE—Victoria, January; Miller Wells Corp. 1 Josephine and Adela DePine, John D. Wright Sur., A-125, Catahoula, 3,950-52 ft., 2,532 M.c.f. of gas, TD 5,310 ft.

FORDTRAN, WEST—Victoria, January; Kirby Petroleum Co. 1 R. T. Buchanan et al, Indiola RR Sur., A-204, Wilcox, 8,157-62 ft., 274 bbl. of oil, TD 8,517 ft. 6 wells at year end.

FRANCITAS, NORTH—Jackson, March; Sun Oil Co. and The Texas Co. 1 Rogers Unit, J. Powers Sur., Vicksburg, 8,649-51 ft., 208 bbl. of oil, TD 10,000 ft. 5 wells at year end.

GOEBEL, NORTHEAST—Live Oak, May; Sunray Oil Corp. 1 Otto W. Zamzow, Refugio County School Land Sur. 6, A-398, Wilcox 7,248-50 ft., 115 bbl. of oil, TD 7,252 ft. 2 wells at year end.

HENZE—DeWitt, June; Rowan & Hope 1 Mary Henze, Jose Santos Sur., A-420, Slick-Wilcox, 7,332-70 ft., 12,000 M.c.f. of gas and 396 bbl. of cond., TD 7,614 ft. 2 wells at year end.

HOLLINGSWORTH RANCH—Jackson, June; Curtis Singleton Drilling Co. 2 R. L. Hollingsworth, Eli Mercer Sur., A-54, Frio, 3,830-36 ft., 26,000 M.c.f. of gas, TD 4,160 ft.

HORDES CREEK, EAST—Goliad, January; Frank Michaux 1 Kauffman Estate, Geo. Sutherland Sur., Wilcox, 7,675-710 ft., 16 bbl. of condensate, TD 8,029 ft.

KAHON, NORTH—Live Oak, April; Tide Water Associated Oil Co. 1 Hicks Williams, F. G. Hines Sur., A-643, Luling (Wx), 7,278-80 ft., 92 bbl. of oil, TD 7,802 ft. 2 wells at year end.

LISKA—Live Oak, October; Harry Hotchkins 1-A W. Liska, John Jefferman Sur., Hockley, 975-81 ft., 8 bbl. of oil, TD 982 ft.

LONG MOTT—Calhoun, January; Fullerton Oil Co. and Ryan Consolidated Oil Corp. 1 T. A. McDonald, Miguel Castillo League, Frio, 9,654-84 ft., 12 bbl. of cond., TD 9,740 ft.

MAGNOLIA BEACH—Calhoun, August; Alcoa Mining Co. B-1 Mary A. Hubbard, Geo. H Hall Sur., Frio, 8,707-11 ft., 201 bbl. of oil, TD 8,744 ft. 2 wells at year end.

MENGERS—Bee, August; Newman Bros., Alaska Steamship Co. et al, 2 Chas. Mengers, G. Garcia Sur., A-167, Vicksburg, 4,800-20 ft., 12,400 M.c.f. of gas, TD 4,930 ft.

PARGMANN—Karnes, September; Horrigan & Fohs 1 Mary Pargmann, Victor Blanco Sur., A-3, Luling, 7,158-78 ft., 100 bbl. of cond., TD 7,400 ft.

POINT COMFORT—Calhoun, January; Falcon Seaboard Oil Co. 1 Mrs. Maude B. Taylor, Phillip Dimmit Sur., A-11, Vicksburg-Frio, 8,316-22 ft. and 8,419-68 ft., 150 bbl. of cond., TD 9,175 ft.

RAGSDALE—Bee, February; The Texas Co. 1 Sallie Ragsdale, A. J. Davis Sur., A-155, Wilcox, 8,068-72 ft., 15 bbl. of oil, TD 10,468 ft.

REFUGIO, EAST—Refugio, January; Union Oil Co. of Calif., 1 J. J. O'Brien, Refugio Town Tract Grant, Vicksburg, 6,402-08 ft., 40 bbl. of cond., TD 8,502 ft. 2 wells at year end.

SALLY—DeWitt, June; George W. Graham et al, 1 O. L. Caruthers, H. M. Sally

Sur. A-417, Wilcox, 7,452-48 ft., 56 bbl. of cond., TD 7,562 ft.

SANGER—Live Oak, May; Howeth & Mason 1 Sanger Estate, GC&SF RR Sur., A-637, Jackson, 2,639-51 ft., 2,000 M.c.f. of gas, TD 2,716 ft.

SEADRIFT—Calhoun, January; Quintana Petroleum Co. 1 Jamie Hynes, J. F. de la Fuentes Sur., Frio, 7,789-95 ft., 77 bbl. of cond., TD 9,867 ft.

SHERIFF SMITH—Live Oak, October; Sunray Oil Corp. 1 W. A. Smith, T. B. Reese Sur., Wilcox, 7,030-40 ft., 53 bbl. of oil, TD 7,548 ft. 2 wells at year end.

TIVOLI—Refugio, June; P. R. Rutherford et al, J-1 P. H. Fagan, James Fagan Sur., A-27 & Michael Reilly Sur., A-57, Het, 4,708.12 ft., 110 bbl. of oil, TD 4,715 ft.

TRAYLOR RANCH—Calhoun, January; Lamar Hunt Trs. Co. 1 M. T. Brooking, Thos. Cox Sur., Frio, 8,858-75 ft., 85 bbl. of cond., TD 9,500 ft.

WORCHESTER—Calhoun, January; Jorn W. Mecon 8 Minnie S. Welder, C. F. Worchester Sur., A-153, Frio, 6,570-74 ft., 175 bbl. of cond., TD 8,917 ft.

UNNAMED—Bee, September; Heep Oil Corp. B-1 Claude E. Heard, Jeremiah Tool Sur., A-66, 4,274-80 ft., 25,000 M.c.f. of gas, TD 4,955 ft.

UNNAMED—Bee, September; R. S. Randerson 1 Slick, T. M. Thurston Sur., A-315, 3,201-13 ft., 13,000 M.c.f. of gas, TD 3,500 ft.

UNNAMED—Calhoun, July; Alcoa Mining Co. 172-1 State Lease 35951, in San Antonio Bay, State Tract 172, 2,630-39 ft. and 2,856-68 ft., 9,000 M.c.f. of gas, TD 6,089 ft.

UNNAMED—Calhoun, July; Producers Investment Corp. 1 Wynne & Morris, William Little Sur., 7,426-40 ft., 16 bbl. of oil, TD 8,415 ft.

UNNAMED—Calhoun, August; Quintana Petroleum Corp. 1 W. C. Melbourn, I&GN RR Co. Sur., A-97, Frio, 7,800-06 ft., 122 bbl. of oil, TD 9,192 ft.

UNNAMED—Calhoun, November; C. G. Glasscock 1 F. A. Street, Casillas S. Paschall & J. J. Ogsberry Sur., 5,773-80 ft., 128 bbl. of cond., TD 5,895 ft.

UNNAMED—DeWitt, November; Magnolit Pet. Co. 1 Anna Sinast, Henry Clark League, A-112, Slick, 7,343-59 ft., 5,000 M.c.f. of gas, TD 7,462 ft.

UNNAMED—DeWitt, December; Deep Rock Oil Corp. 1 A. J. Riesterer, Thos. H. Bell Sur., 8,277-82 ft., 81 bbl. of oil, TD 8,545 ft.

UNNAMED—Goliad, September; Dallas Husky 2 J. Fell, Sampson McTornall Sur., A-195, 2,030-40 ft., gas well, no gage, TD 2,950 ft.

UNNAMED—Live Oak, May; Delhi Oil Corp. 1 R. C. Lyne, Dr. C. F. Simmons Farm Lots Subdivision, Wilcox, 7,420-40 ft., 17,000 M.c.f. of gas, TD 7,718 ft. 2 wells at year end.

UNNAMED—Live Oak, November; Lee Bros. Oil Co. 1 Clyde Boothe, M. B. Kivlin Sur., A-21, 3,270-80 ft., 3,140 M.c.f. of gas, TD 4,200 ft.

UNNAMED—Refugio, February; Kirkwood & Morgan, Inc. 1 C. H. Dean, Jose Maria Gregoria Cobian Sur., Oakville, 2,717-22 ft., 125,000 M.c.f. of gas, TD 5,468 ft.

UNNAMED—Refugio, May; P. R. Rutherford 1 William Avery, Edward Perry League, A-40, Oakville, 2,272-87 ft., 75,000 M.c.f. of gas, TD 6,559 ft.

UNNAMED—Refugio, October; C. L. Norsworthy, Jr., 1-A T. C. Holeman, Michael Reilly Sur., 2,048-54 ft., 8,200 M.c.f. of gas, TD 2,063 ft.

UNNAMED—Victoria September; G. W. McCarter 1 Alex Angerstein, Zepeda Grant, A-128, 2,200 ft., 20,000 M.c.f. of gas, TD 4,300 ft.

UNNAMED—Victoria, December; Sunray Oil Corp. 16 J. Pickering, J. W. Black Sur., A-133, Frio, 5,895-98 ft., 81 bbl. of oil, TD 7,800 ft.

NEW PAYS

ARNECKEVILLE—DeWitt, March; Oil Drilling Co. 1 O. A. Zengerle, Mumford House Sur., A-22, Wilcox, 7,656-74 ft., 91 bbl. of oil, TD 7,692 ft.

BATTLE—Victoria, August; Morris Cannan, Hawn Bros. and Liebman & Gibson Drilling Co. 2 Pedro Pardo, P. Gallardo Sur., A-32, Frio, 4,766-71 ft. and 4,879-85 ft., 111 bbl. of oil and 19,000 M.c.f. of gas, TD 5,256 ft.

BERCLAIR—Goliad, January; Renwar Oil Corp. et al, 1 McCoy Trustee, T. Simmons Sur., A-292, Frio, 2,203-05 ft., 2,200 M.c.f. of gas, TD 3,574 ft.

BERCLAIR—Goliad, January; Magnolia Petroleum Co. 5 Wilkinson Estate, William P. Miller Sur., Vicksburg, 3,207-09 ft., 73 bbl. of oil, TD 3,280 ft. 21 wells at year end.

BERCLAIR—Goliad, March; Kirkpatrick & Coates 11 Terrell, Sampson McTornall Sur., Frio, 2,223-35 ft., 22 bbl. of oil, TD 3,212 ft. 6 wells at year end.

BERCLAIR—Goliad, June; Scurlock Oil Co. 1 Methodist Church, W. P. Miller Sur., Frio, 2,239-42 ft., 30 bbl. of oil, TD 3,244 ft. 9 wells at year end.

BLANCONIA, SOUTH—Bee, April; Bridwell Oil Co. A-4 H. C. Wood, James McGeehan Sur., A-38, Vicksburg, 5,326-29 ft., 66 bbl. of oil, TD 5,329 ft. 3 wells at year end.

BOEHM—Refugio, January; Arnold O. Morgan 1 E. Fricke, Estaeban Lopez Sur., Frio, 5,297-301 ft., 79 bbl. of oil, TD 6,603 ft. 2 wells at year end.

CABEZA CREEK—Goliad, March; Continental Oil Co. 34 J. E. Pettus et al, Sebastiano Vela Sur., Wilcox, 7,550-64 ft., 122 bbl. of oil, TD 7,794 ft. 4 wells at year end.

CHAPA—Live Oak, September; The Atlantic Refining Co. 1 Sanger Heirs, GC&SF RR Co. Sur. 391, A-711, 8,658-70 ft., 240 bbl. of condensate, TD 9,298 ft.

CORDELE, WEST—Jackson, February; H. J. Porter et al., 1 Alma Traylor, F. Adam Sur., A-1, Oakville, 2,422-46 ft., 72,000 M.c.f. of gas, TD 3,310 ft.

CORDELE, WEST—Jackson, March; H. J. Porter 3 Rudolph Yaussi Estate et al., John McWhite Sur., A-468, Oakville, 2,798-99 ft., 20 bbl. of oil, TD 2,805 ft. 2 wells at year end.

FANNIN, EAST—Goliad, February; United North & South Dev. Co. 1 B. B. & Bobbie W. Gayle, G. Hall & W. Crane Sur., Catahoula, 2,567-73 ft., gas well, no gage, TD 2,575 ft.

FRANCITAS—Jackson, November; The Texas Co. 1 Mrs. Ethel M. Beckenhauer, R. D. Moore Sur., A-55, 7,377-80 ft., 55 bbl. of oil, TD 8,000 ft.

GLADYS POWELL—Goliad, November; Sunray Oil Corp. 1 Mrs. Irogene Ray Hall, Vincente Ramon Sur., A-241, Luling, 7,762-73 ft., 8,000 M.c.f. of gas, TD 8,433 ft.

GOHLKE, HELEN—De Witt, September; Shell Oil Co. 4 Helen Gohlke, H. C. Kitchen Sur., Yegua, 5,351-58 ft., 157 bbl. of oil, TD 8,202 ft. 2 wells at year end.

GOREE—Bee, July; H. R. Smith-H. J. Mooser & F. William Carr 1 G. W. Goree, Thos. B. Barton Sur., A-83, Wilcox, 7,014-26 ft., 30,000 M.c.f. of gas, TD 7,500 ft.

HOBSON—Karnes, April; Bill Forney & Chas. Winn 1 Emil Swize, Don Erasmo Seguin Grant, A-10, Reklaw, 3,954-56 ft., 108 bbl. of oil, TD 4,047 ft. 5 wells at year end.

LOLITA—Jackson, April; Abe Seibel 1-A Ware-Kelso Unit, I&GN Sur. 11, A-141, Frio, 6,301-03 ft., 45 bbl. of oil, TD 8,085 ft. 2 wells at year end.

MALEY—Bee, February; Superior Oil Co. 3 Mrs. Celia Maley et al., A. B. M. Sur., A-79, Wilcox (Claiborne), 7,403-15 and 7,384-96 ft., 77 bbl. of oil, TD 8,360 ft. 2 wells at year end.

McFADDIN—Victoria, March; The Chicago Corp. B-9 J. A. McFaFddin Estate, J. W. Moore Sur., A-479, Miocene, 3,400-10 & 2,929-36 ft., 68,000 M.c.f. of gas, TD 6,500 ft.

McFADDIN—Victoria, May; The Chicago Corp. B-10 J. A. McFaddin, A. J. Gray Sur., Miocene, 2,224-45 ft., 68,000 M.c.f. of gas, TD 3,453 ft.

McFADDIN, EAST—Victoria, January; Union Producing Co. et al., A-25 McFaddin, Maria J. Traviesa Sur., A-114, Frio, 5,900-06 ft., 153 bbl. of oil, TD 6,051 ft. 2 wells at year end.

McFADDIN, EAST—Victoria, April; Union Production Co. et al., A-29 McFaddin, et al, Maria J. Traviesa Grant, Marginulina, 5,222-23 ft., 33 bbl. of oil, TD 6,415 ft.

PLUMMER-WILCOX—Bee, August; Midstates Oil Corp. 1 Zeno Barber, C. B. Shain Sur., A-305, Slick, 6,688-700 ft., 106 bbl. of oil, TD 7,110 ft. 3 wells at year end.

REFUGIO—Refugio, June; Sam E. Wilson, Jr., 1 Rogers Estate, James Powers Sur., A-50, Het, 4,750-55 ft., 91 bbl. of oil, TD 6,503 ft.

REFUGIO, EAST—Refugio, March; Union Oil Co. of Calif. 2 J. J. O'Brien, Refugio Town Tract Sur., A-345, Frio, 5,853-58 ft., 82 bbl. of oil, TD 6,550 ft. 3 wells at year end.

ROOKE—Refugio, March; Plymouth Oil Co. 1 A. D. Rooke et al., J. M. Aldrete Sur., Vicksburg, 9,020-32 ft., 3,300 M.c.f. of gas, TD 9,036 ft.

SARCO CREEK—Goliad, June, Ginther, Warren & Ginther 10 Carrie G. Wood et al., Sarah Hall Sur., A-19, Frio, 4,694-704 ft., 20,000 M.c.f. of gas, TD 5,095 ft.

SLIVA—Bee, April; Miller Wells, Inc., 1 Lado Muhlstein et al., Jackson M. Reed Sur., A-481, Vicksburg, 4,400-06 ft., 180 M.c.f. of gas, TD 4,480 ft. 5 wells at year end.

SWAN LAKE—Jackson, February; The Texas Co. 1 E. C. LaBauve, Hugh McGuffin Sur., A-43, Frio, 8,692-94 ft., 133 bbl. of oil, TD 9,215 ft. 5 wells at year end.

SWAN LAKE—Jackson, June; Southern Minerals Corp. 16 G. T. Brooking, Josiah H. Bell Sur., A-7, Frio, 7,726-29 ft., 145 bbl. of oil, TD 8,699 ft. 2 wells at year end.

TERRELL POINT—Goliad, June; Gasoline Prod. Corp. 3 Stella E. Johnson, Martin Lawler Sur., A-20, 4,645-49 ft., 126,000 M.c.f. of gas, TD 4,745 ft. 3 wells at year end.

TERRELL POINT, WEST—Goliad, February; Paul J. Fly et al., K. M. Lewis, W. P. Patterson Sur., A-325, Frio, 4,636-40 ft., 17,000 M.c.f. of gas, TD 5,015 ft. 2 wells at year end.

WEESATCHE—Goliad, March; Atlantic Refg. Co. 1 Jean McCampbell Davis, J. Simmons Sur., A-253, Jackson, 3,850-60 ft., 69 bbl. of oil, TD 8,001 ft. 2 wells at year end.

TEXAS GULF COAST

District 3

NEW POOLS

BASTON, NEW—Hardin, February; Stanolind Oil & Gas Co.-Freeport Sulphur Co. 1 Kirby Corporation, Hardin County School Land Sur., A-260, Yegua, 7,230-40 ft., 275 bbl. of oil, TD 7,400 ft. 2 wells at year end.

BERNARD, SOUTH—Wharton, January; R. E. Hibbert 1 Valigura, Thos. Slaughter Sur., A-59, Cook Mountain, 7,623-72 ft., 90 bbl. of cond., TD 8,500 ft.

CAMPTOWN—Newton, June; Houston Oil Co. of Texas-American Republics Corp. B-2 Earl C. Hankamer, HT&B RR Sur. Sec. 16, A-932, 7,225-26 ft., 163 bbl. of oil, TD 7,343 ft. 4 wells at year end.

CASTILLO—Jasper, June; American Republics Corp. & Houston Oil Co. of Texas 2 Salvador Castillo Fee, Salvador Castillo League, A-6, 6,987-90 ft., 51 bbl. of oil, TD 8,125 ft.

CEDAR BAYOU, NORTH—Harris, January; Commercial Petroleum & Transport 1 Herbert Crawford, Christian Smith Sur., A-69, 6,362-67 ft., 179 bbl. of oil, TD 8,520 ft. 11 wells at year end.

CEDAR LAKE—Brazoria, September; Brazos Oil & Gas Co. 1 Ducroz, Calvin Sumrells Sur., A-368, 3,068-80 ft., gas well, no gage, TD 7,804 ft.

DUFFY—Wharton, April; William Carr 1 Duffy, R. T. Smith Sur., A-544, 5,462-72 & 5,478-84 ft., 30,000 M.c.f. of gas, TD 5,538 ft.

FULSHEAR—Fort Bend, February; Union Producing Co. 1 Watson, S. Hobermaker Sur., A-189, Yegua, 6,837-39 ft., 102 bbl. of oil, TD 8,003 ft. 4 wells at year end.

GUM BAYOU—Liberty, April; General Crude Oil Co. C-1 Esperson, Geo. L. Pace Sur. 8,911-15 ft., 90 bbl. of condensate, TD 11,694 ft. 3 wells at year end.

LOUISE, NORTH—Wharton, March; Republic Natural Gas Co. & Chas. H. Osmond 2 Beck-Rasmussen, J. Mitchell Sur., A-651, Catahoula, 2,598-605 ft., 54,000 M.c.f. of gas, TD 3,222 ft. 2 wells at year end.

MULDOON—Fayette, December; Hamman Oil & Refining Co. 1 Frank Weidel, John Vivien ⅛ League, Wilcox, 2,361-64 ft., 84 bbl. of oil, TD 2,503 ft.

OLD WASHINGTON—Washington, June; Sinclair Oil & Gas Co. 1 Bess Henry, Wil-

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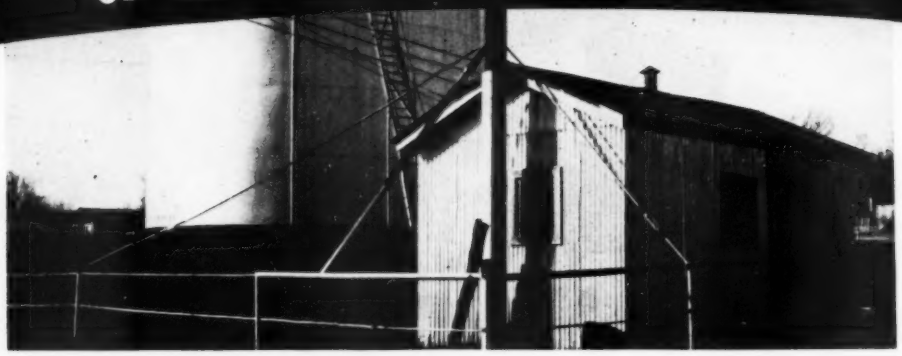

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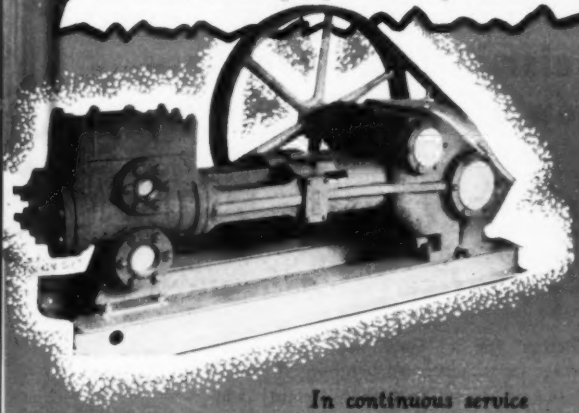

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GASO PUMPS
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liam Gates Sur., A-46, Wilcox, 9,214-18 ft., 243 bbl. of oil, TD 11,495 ft.

OLIVER POINT — Matagorda, January; Brazos Oil & Gas Co. 1 State of Texas "O," State Tract 302 Matagorda Bay, Miocene, 5,163-65 ft., 80 bbl. of oil, TD 5,907 ft.

PHOENIX LAKE—Orange, July; Ohio Oil Co. 1 Lutcher Moore Lumber Co., C. L. Higginbotham Sur., A-414, 7,983-87 ft., 284 bbl. of oil, TD 9,038 ft. 3 wells at year end.

SHERIDAN — Colorado, February; Oil Drilling Co. 1 Carruth, et al, Hays, Crawford & Holden Sur., Wilcox, 8,418-28 ft., 5,200 M.c.f. of gas, TD 9,936 ft.

TAIT—Colorado, May; Superior Oil Co. D-1 Tait, John Byrne Sur., A-10, 10,205-27 ft., 17 bbl. of condensate, TD 12,775 ft.

TRINITY BAY — Chambers, January; Humble Oil & Refining Co. F-1 Galveston Bay State, Galveston Bay Sec. 28-A, 8,298-306 ft., 176 bbl. of oil, TD 9,050 ft. 6 wells at year end.

VICKERS—Hardin, July; American Republics Corp.-Houston Oil Co. 1 J. A. Vickers, John A. Vickers Sur., A-52, 7,203-08 ft., 4,919 M.c.f. of gas, TD 7,854 ft. 2 wells at year end.

WILLIS, WEST—Montgomery, January; P.L.D. Well Service Co. 1 Snow, William Weir Sur., Cockfield, 3,731-38 ft., gas well, no gage, TD 3,752 ft.

WILLOW SLOUGH, NORTH—Chambers, February; Sun Oil Co. A-1 Connerly, G. J. Mayes Sur. 106, A-439, Frio, 9,520-30 and 9,538-48 ft., 120 bbl. of oil, TD 10,314 ft.

WINN—Wharton, January; H. C. Cockburn 1 W. D. Winn, S. Castleman Sur., A-12, Miocene, 4,184-88 ft., 16,000 M.c.f. of gas, TD 5,557 ft.

WITHERS, NORTH—Wharton, January; Kingwood Oil Co. 2 Lacy W. Armour, et al, Chas. Howard League, A-181, Frio, 5,301-08 ft., 22,000 M.c.f. of gas, TD 6,839 ft.

UNNAMED—Austin, March; Sun Oil Co. 1 Mikeska, S. F. Austin 4 League Grant, 9,313-23 ft., 151 bbl. of cond., TD 10,505 ft.

UNNAMED—Austin, April; H. L. Hawkins 1 Mewis, J. P. Stephenson Sur., A-95, 10,455-80 ft., 53 bbl. of oil, TD 11,000 ft.

UNNAMED—Austin, June; Oil Drilling, Inc., 1 D. L. Hart, et al, David T. Davis Sur., A-160, 9,562-78 ft., 3,100 M.c.f. of gas, TD 10,252 ft.

UNNAMED—Austin, June; Oil Drilling Co., Inc., 1 C. J. Marik, Randolph Von Roeder Sur., A-308, Wilcox, 9,197-211 ft., 159 bbl. of oil, TD 10,351 ft.

UNNAMED—Brazoria, September; Champlin Refining Co. A-1 State Lease, Tract 13, Bastrop Bay, 5,770-88 ft., 60,000 M.c.f. of gas, TD 7,256 ft.

UNNAMED—Brazoria, October; G. S. Hamon & Wheless Oil Co. 1 W. E. Tieman, BBB&C Sur., A-161, 11,184-90 ft., 6,400 M.c.f. of gas, TD 11,338 ft.

UNNAMED—Chambers, November; Standard Oil Co. of Texas 1 W. F. Gau, John S. Roberts Sur., A-21, 8,272-86 ft., 74 bbl. of cond., TD 9,047 ft.

UNNAMED—Colorado, April; Houston Oil Co. of Texas 1 Duncan, James Ross Sur., A-39, 9,316-26 & 9,354-77 ft., 175 bbl. of cond., TD 9,597 ft.

UNNAMED—Colorado, August; Ohio Oil Co. 1 W. K. Lehrer, et al, Naham Mixon Sur., A-402, 6,180-90 ft., 23 bbl. of oil, TD 9,946 ft.

UNNAMED—Fayette, June; Deep Rock Oil Co. 1 Standard Trust, James Parrott ⅓ League, A-258, Wilcox, 2,226-66 ft., 71 bbl. of oil, TD 2,274 ft.

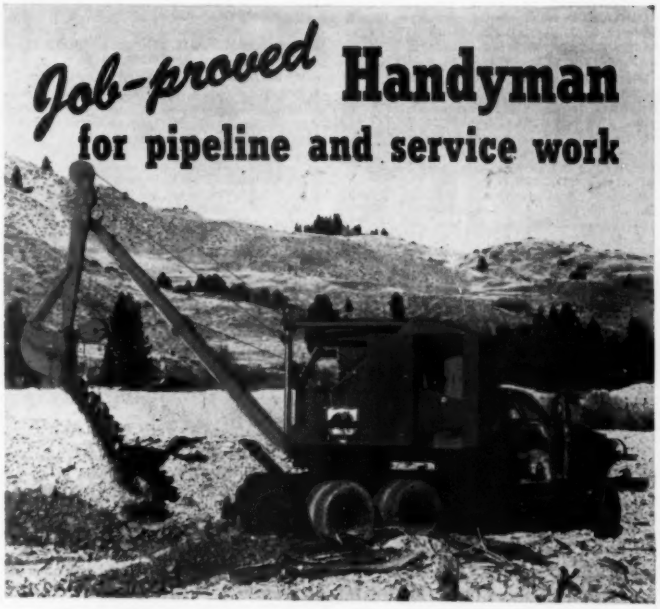
UNNAMED—Ft. Bend, January; Harold Link 2 Horelica, H&TC RR Sur., Sec. 66, 5,246-53 ft., gas well, no gage, TD 5,321 ft.

UNNAMED—Fort Bend, March; Harold Link, et al, 1 Schueneman, H&TC RR Sur. Sec. 18, A-644, 4,626-37 ft., 36,000 M.c.f. of gas, TD 4,677 ft.

UNNAMED—Fort Bend, March; Ralph B. Cantrell 1 M. Pleak, H&TC RR Sur. Sec. 102, A-77, 5,537-41 ft., 82 bbl. of oil, TD 5,576 ft.

UNNAMED—Fort Bend, April; Goldston Oil Corp. 1 Steffek, A. Hodge Sur., A-33, 5,070-90 ft., gas well, no gage, TD 6,700 ft.

UNNAMED—Fort Bend, August; Harold Link 1 Cantrell, et al, Sam Stone Sur., A-660, 4,624-36 ft., gas well, no gage, TD 4,750 ft.



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UNNAMED—Fort Bend, August; R. E. Hibbert & J. R. Butler 2 Gulf Oil Corp., John Lafayette League, 7,553-63 ft., 21,000 M.c.f. of gas, TD 7,905 ft.

UNNAMED—Fort Bend, September; The Texas Co. 1 H. B. McCrary, et al, James Knight & G. W. White League, A-46, 7,470-80 ft., 41 bbl. of oil, TD 7,830 ft.

UNNAMED—Fort Bend, December; Powers Production Co. 1 J. R. Farmer, Joel Lee Sur., A-278, lower Frio, 6,974-78 ft., 66 bbl. of oil, TD 7,215 ft.

UNNAMED—Galveston, March; Stanolind Oil & Gas Co. 4 League, Martin Dunman Sur., 4,536-53 ft., 13 bbl. of oil, TD 5,153 ft.

UNNAMED—Galveston, November; John W. Mecom 1 San Leon Farms, et al, A. Edwards Sur., A-10, 8,445-60 ft., 49 bbl. of oil, TD 10,515 ft.

UNNAMED—Grimes, September; Woodley Petroleum Co. & Stanolind Oil & Gas Co. 1 Iris Clark, Wesley Fisher Sur., A-201, Wilcox, 4,688-92 ft., 21 bbl. of oil, TD 8,198 ft.

UNNAMED— Grimes, December; Gulf Oil Corp. 1 William Gardner, James W. Darwin Sur., A-117, Wilcox, 10,392-10,405 ft., 142 bbl. of oil, TD 10,723 ft.

UNNAMED—Harris, April; Rowan Oil Co. 1 Henry, et al, J. M. Dement Sur., A-288, 6,519-29 ft., 28 bbl. of oil, TD 7,715 ft.

UNNAMED—Harris, November; Amerada Petroleum Corp. 1 Linda F. West, Thomas Hogan Sur., A-326, 7,495-7,500 ft., 85 bbl. of oil, TD 7,922 ft.

UNNAMED—Harris, May; Sun Oil Co. 2 K. Tharp, Frederich H. Rankin Sur., A-57, 8,703-17 ft., 101 bbl. of oil, TD 8,953 ft.

UNNAMED—Jasper, March; American Republics Corp. & Houston Oil Co. 1 Hughes, Henry Webb Sur., A-42, 6,922-94 ft., 64 bbl. of oil, TD 8,103 ft.

UNNAMED—Jefferson, March; The Texas Co. 1 Crow, et al, Seth Davis Sur. 172, 3,602-13 ft., 130 bbl. of oil, TD 4,593 ft.

UNNAMED—Liberty, April; Gulf Oil Corp. 1 Partlow, William Duncan Sur., A-28, 8,700-722 ft., 223 bbl. of oil, TD 9,000 ft.

UNNAMED—Liberty, September; Sohio Petroleum Co. 1 B. E. Quinn, James Humphreys Sur., A-212, Yegua, 7,170-75 ft., 74 bbl. of cond., TD 10,982 ft.

UNNAMED—Liberty, October; R. E. Hibbert 1 Brandes, Thomas Slaughter Sur., A-59, 7,595-7,600 ft., 5,700 M.c.f. of gas, TD 8,517 ft.

UNNAMED—Matagorda, May; Brazos Oil & Gas Co. 2 State of Texas "X-A," State Tract 195, Matagorda Bay, 2,655-85 ft., 1,735 M.c.f. of gas, TD 6,504 ft.

UNNAMED—Matagorda, June; Brazos Oil & Gas Co. 2 M-A State of Texas 35916, Matagorda Bay Tract 179, 5,157-69 ft., gas well, no gage, TD 5,750 ft.

UNNAMED—Matagorda, September; Magnolia Petroleum Co. 1 Ethel Cornelius, J. C. Peyton Sur., A-74, 11,375-85 ft., 192 bbl. of cond., TD 11,485 ft.

UNNAMED—Matagorda, October; Stanolind Oil & Gas Co. 1-B Franz Huebner, Peter Bertrand Sur., A-5, 9,315-31 ft., 4,000 M.c.f. of gas, TD 11,390 ft.

UNNAMED—Matagorda, December; Brazos Oil & Gas Co. 1 State of Texas "E-B," State Tract 55, Tres Palacios Bay, 4,526-38 ft., 26,000 M.c.f. of gas, TD 4,660 ft.

UNNAMED—Matagorda, December; Humble Oil & Refining Co. 1 South El Maton Unit 1, David Ness Sur., A-429, 10,700-704 ft., 124 bbl. of cond., TD 10,900 ft.

UNNAMED—Newton, July; Oil Drilling, Inc., 1 B. E. Quinn, HT&B Sur., A-1198, Yegua, 7,370-72 ft., gas well, no gage, TD 8,770 ft.

UNNAMED—Newton, August; Callery & Hurt, Inc., B-1 T. E. Inman, F. H. Pollard Sur., A-340, 11,354-88 ft., 195 bbl. of oil, TD 11,888 ft.

UNNAMED—Newton, September; Christensen & Matthews 1 V. J. Morgan, et al, J. Champin Sur., A-78, Sec. 11, 7,548-52 ft., 50 bbl. of oil, TD 8,016 ft.

UNNAMED—Orange, May; Union Producing Co. 1 Brown, I&GN RR Co. Sur., A-224, 7,942-47 ft., 100 bbl. of cond., TD 8,300 ft.

UNNAMED—Wharton, April; Republic Natural Gas & Chas. Osmond 1 Earl, Henry Mills Sur., A-270, 4,575-81 ft., 5,468 M.c.f. of gas, TD 5,210 ft.

UNNAMED — Wharton, April; Republic Natural Gas & Chas H. Osmond 1 Hill, W. J. Godsey Sur., A-460, 4,438-42 ft., 5,500 M.c.f. of gas, TD 5,250 ft.

UNNAMED—Wharton, August; Mac Drilling Co 1 Joe Tobola, I&GN RR Sur. Sec. 14, A-236, 3,907-10 ft., 3,109 M.c.f. of gas, TD 4,560 ft.

NEW PAYS

BATSON—Hardin, March; The Atlantic Refining Co. 7 Lou Cruse, F. H. Green Sur., A-24, Yegua, 5,175-210 ft., 174 bbl. of oil, TD 6,002 ft. 7 wells at year end.

BIG HILL—Jefferson, September; McCarthy Oil & Gas Corp. 1-B Mrs. Dora Gill, et al, T&NO RR Sur., A-375, 8,445-52 ft., 144 bbl. of oil, TD 9,714 ft. 3 wells at year end.

BLUE RIDGE—Fort Bend, October; John Mitchell, et al, 1 Evans, ETRR Sur., Sec. 1, Vicksburg, 7,841-46 ft., 205 bbl. of oil, TD 7,908 ft.

BLUE RIDGE—Fort Bend, June; Petroleum Management Co. 2 Robinson-Bashara, Hicks Shropshire Sur., A-313, 4,146-50 ft., 120 bbl. of oil, TD 4,303 ft. 3 wells at year end.

BOLING DOME — Wharton, November; Michael T. Halbouty, et al, A-1 Gary Estate, Seth Ingram Sur., A-33, 6,834-40 ft., 169 bbl. of oil, TD 7,213 ft.

CAMPTOWN—Newton, September; Houston Oil Co. of Texas and American Republics Corp. B-5 Earl C. Hankamer, et al, "B," HT&B RR Sur., A-933, 7,219-21 ft., 42 bbl. of oil, TD 7,227 ft.

CEDAR LAKE — Brazoria, November; Brazos Oil & Gas Co. 2 J. L. Ducroz, Calvin Summels Survey, A-368, 3,932-36 & 3,938-46 ft., gas well, no gage, TD 4,508 ft.

CLAM LAKE—Jefferson, October; Shell Oil Co. 24 McFaddin Trust, Mrs. Sarah A. Pace Sur., A-783, 173 bbl. of oil, TD 6,620 ft. 2 wells at year end.

DAYTON, NORTH—Liberty, January; Production Service Oil Corp. 1 Paraffine Oil Co., Edmond Pruitt Sur., A-448, Yegua,

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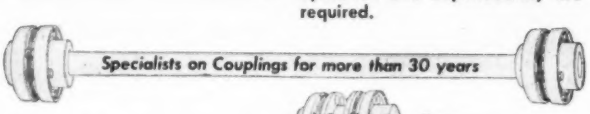

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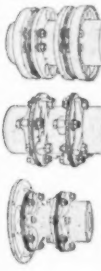
Patented Flexible Disc Rings of special steel transmit the power and provide for misalignment and end float.

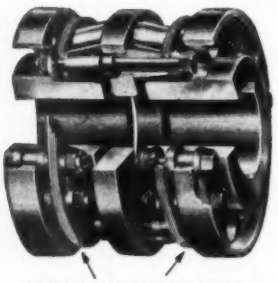
Thomas Couplings have a wide range of speeds, horsepower and shaft sizes:

½ to 40,000 HP
1 to 30,000 RPM



BACKLASH FRICTION WEAR and CROSS-PULL are eliminated

Lubrication is not required!



PATENTED FLEXIBLE DISC RINGS

THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

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WHERE YOU CAN'T GET WATER . . .

Humble Oil and Failing Exploration Co. operate a fleet of truck-mounted compressors in exploration areas where it is difficult to obtain water. Note efficient air ejection, by 250 cfm Jaeger Compressor. This speeds bit penetration as much as 40%.

Where water for mudding is not readily available, Failing Exploration Co. and Humble Oil Co. are efficiently using compressed air to blow cuttings from shot holes. A Jaeger "new standard" Model 250 Compressor is used with the rig shown above because its rated capacity of 250 cfm of air at 100 psi (instead of the usual 210 cfm) enables it to maintain the 30 to 40 lbs. gauge pressure needed to eject cuttings from 5" holes drilled to 30 to 40 ft. depths. Keeping the hole clean with adequate air pressure speeds drill penetration as much as 40% and bit life is doubled in some exploration areas.

Jaeger Compressors are preferred for shot hole drilling because they deliver 15% to 25% more air than any comparable old-standard unit, and they supply compressed air at lowest cost per cubic foot of any compressor on the market. Available in capacities of: 250 cfm (instead of old-standard 210), 365 cfm (instead of old-standard 315), and 600 cfm (instead of old standard 500). See your Jaeger distributor or write for Catalog JC-1.

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PORTABLE COMPRESSORS • SELF-PRIMING PUMPS • CONCRETE MIXERS

8,110-20 ft., 10,600 M.c.f. of gas, TD 8,520 ft.

DAYTON, NORTH—Liberty, January; The Texas Co. 4 J. D. Williams, H&TC Sec. 123, Jackson, 5,041-50 ft., 211 bbl. of oil, TD 5,050 ft. 4 wells at year end.

DAYTON, SOUTH—Liberty, November; The Texas Co. 1 William Duncan Welder, et al, William Duncan Sur., A-28, 8,945-47 ft., 254 bbl. of oil, TD 10,004 ft.

DUFFY—Wharton, April; William Carr 2 Duffy, A. T. Smith Sur. 90, A-554, 5,636-39 ft., 133 bbl. of oil, TD 5,910 ft. 5 wells at year end.

DURKEE—Harris, August; Union Producing Co. 1 Hurt, Phillip Thompson Sur., A-768, 7,910-30 ft., 3,707 M.c.f. of gas, TD 8,010 ft.

DURKEE (SETTEGAST)—Harris, January; Union Producing Co. 1 Settegast, H&TC RR Sur. 12, A-1168, Yegua, 7,053-55 ft., 180 bbl. of oil, TD 7,792 ft. 4 wells at year end.

DURKEE—Harris, March; Petrex Oil Corp. 1 Sadie H. Southard, George Green Sur., A-281, Look sand, 7,196-204 ft., 193 bbl. of oil, TD 8,004 ft. 10 wells at year end.

FANNETT—Jefferson, September; Gulf Oil Corp. 21-A Junker-Spencer, et al, Tract "E," 7,366-74 ft., 182 bbl. of oil, TD 9,883 ft. 2 wells at year end.

FRELSBURG—Colorado, September; Sinclair Oil & Gas Co. 1 H. R. Cullen, Casper Simon Sur., A-502, Cullen, 9,672-80 ft., 366 bbl. of oil, TD 10,425 ft.

GOOSE CREEK—Harris, August; Carter Taylor 1 Otis E. Donahoe, Lot 8, Whiting Block 15, Jones Addn. to Pelly townsite, 4,617-20 ft., 85 bbl. of oil, TD 4,667 ft. 5 wells at year end.

HAMEL—Colorado, October; Rex Cauble 1 J. F. Walker, J. E. Smith Sur., A-503, Wilcox, 6,670-80 ft., 42 bbl. of oil, TD 10,428 ft.

HANKAMER—Liberty, February; Gulf Oil Corp. B-1 Kahn, et al, H&TC Sur., Sec. 21, A-233, Frio, 5,123-38 ft., 119 bbl. of oil, TD 6,530 ft. 5 wells at year end.

HILLISTER, EAST—Tyler, September; C. N. Housh-Humble Oil & Refining Co. 1 Read, et al, BBB&C Sur., A-109, 9,804-14 ft., 13,500 M.c.f. of gas, TD 9,904 ft.

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CUTS COST *many* WAYS

A typical example of how Kinney's simplified hydraulic header manifold is controlling paraffin and effecting substantial savings for operators everywhere!

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Below—SOLUBLE MECHANICAL PLUGS

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HULL—Liberty, December; American Republics Corp. 17 William Smith Fee, William Smith Sur., 8,995-9,006 ft., 207 bbl. of oil, TD 9,539 ft.

HUTCHINS-KUBELA—Wharton, January; Adams & Haggarty 3 J. F. Jubela Est., H&TC Sec. 4, A-660, Frio, 4,668-71 ft., 113 bbl. of oil, TD 4,672 ft. 2 wells at year end.

HUTCHINS-KUBELA—Wharton, January; Henry C. Adams 2 J. F. Kubela Estate, H&TC RR Sur. Sec. 4, A-660, Frio, 4,659-63 ft., 132 bbl. of oil, TD 4,664 ft. 3 wells at year end.

LAKEVIEW-HUTCHINS—Wharton, January; W. A. Clarke, Jr., 1 Ustynik, I&GN Sec. 14, A-235, Frio, 3,962-68 ft., 78 bbl. of oil, TD 5,777 ft.

LANE CITY—Wharton, January; Sohio Petroleum Co. 2 Mrs. Jennie Beard, Sylvanus Castleman Sur., A-11, Het., 5,423-28 ft., gas well, no gage, TD 5,665 ft. 3 wells at year end.

LIBERTY, SOUTH—Liberty, January; Josey-Nelms-Halbouty 2 E. B. Pickett, M. G. White Sur., A-17, 3,908-22 ft., 30 bbl. of oil, TD 4,636 ft.

LIBERTY TOWNSITE—Liberty, September; Floyd L. Karsten 1 Geraldine Humphries, East League of Liberty townsite, 9,085-9,140 ft., 94 bbl. of oil, TD 9,500 ft.

MOSS BLUFF—Chambers, October; Humble Oil & Refining Co. 13 R. S. Sterling Fee, James McFaddin Sur., A-76, 6,466-75 ft., 105 bbl. of oil, TD 6,500 ft.

NELSON—Hardin, September; American Republics Corp. & Houston Oil Co. of Texas 1 Mary J. Cunningham, et al, O. C. Nelson League, A-40, 7,078-82 ft., 122 bbl. of oil, TD 7,093 ft.

OLD WASHINGTON—Washington, September; Sinclair Oil & Gas Co. 2 Bess Henry, William Gates League, A-46, Wilcox, 8,950-60 ft., 68 bbl. of cond., TD 10,745 ft.

PIERCE JUNCTION—Harris, January; Albert Plummer 4 Kate F. Whitehead, James Hamilton Sur., lower Frio, 5,456-62 ft., 142 bbl. of oil, TD 5,545 ft. 6 wells at year end.

SOUR LAKE—Hardin, April; Sun Oil Co. 1 Dishman-Lucas, Isaac Bridge Sur., Sec. 4, A-132, 9,828-43 ft., 196 bbl. of oil, TD 11,025 ft. 3 wells at year end.

SPINDLETOP—Jefferson, January; Stanolind Oil & Gas Co. B-107 Gladys City Oil & Mfg. Co., John Veatch Sur., Heterostegina lime, 4,766-800 ft., 96 bbl. of oil, TD 5,190 ft. 2 wells at year end.

SOUTHWEST TEXAS

District 4

NEW POOLS

BLACKJACK—Aransas, June; Western Natural Gas Co. 13 St. Charles Ranch Co., I. Dowess Sur., A-53, Vicksburg, 10,320-60 ft., 86,000 M.c.f. of gas, TD 11,275 ft.

BLACKJACK—Aransas, September; Western Natural Gas Co. 16 St. Charles Ranch Co., Aransas County School Lands Sur., Frio, 8,288-98 ft., 240 bbl. oil, TD 8,991 ft.

DAGGER ISLAND—Nueces, June; Atlantic Refining Co. 1 State Tract 396, State Tract 396 in Corpus Christi Bay, 7,926-46 ft., 202 bbl. oil, TD 9,495 ft. 2 wells at year end.

DERRY—Duval, March; Hawn Bros., et al, 1 Lulu W. Pursch, BS&F Sur. 115, Government Wells, 2,499-501 ft., 2,050 M.c.f. gas, TD 2,550 ft.

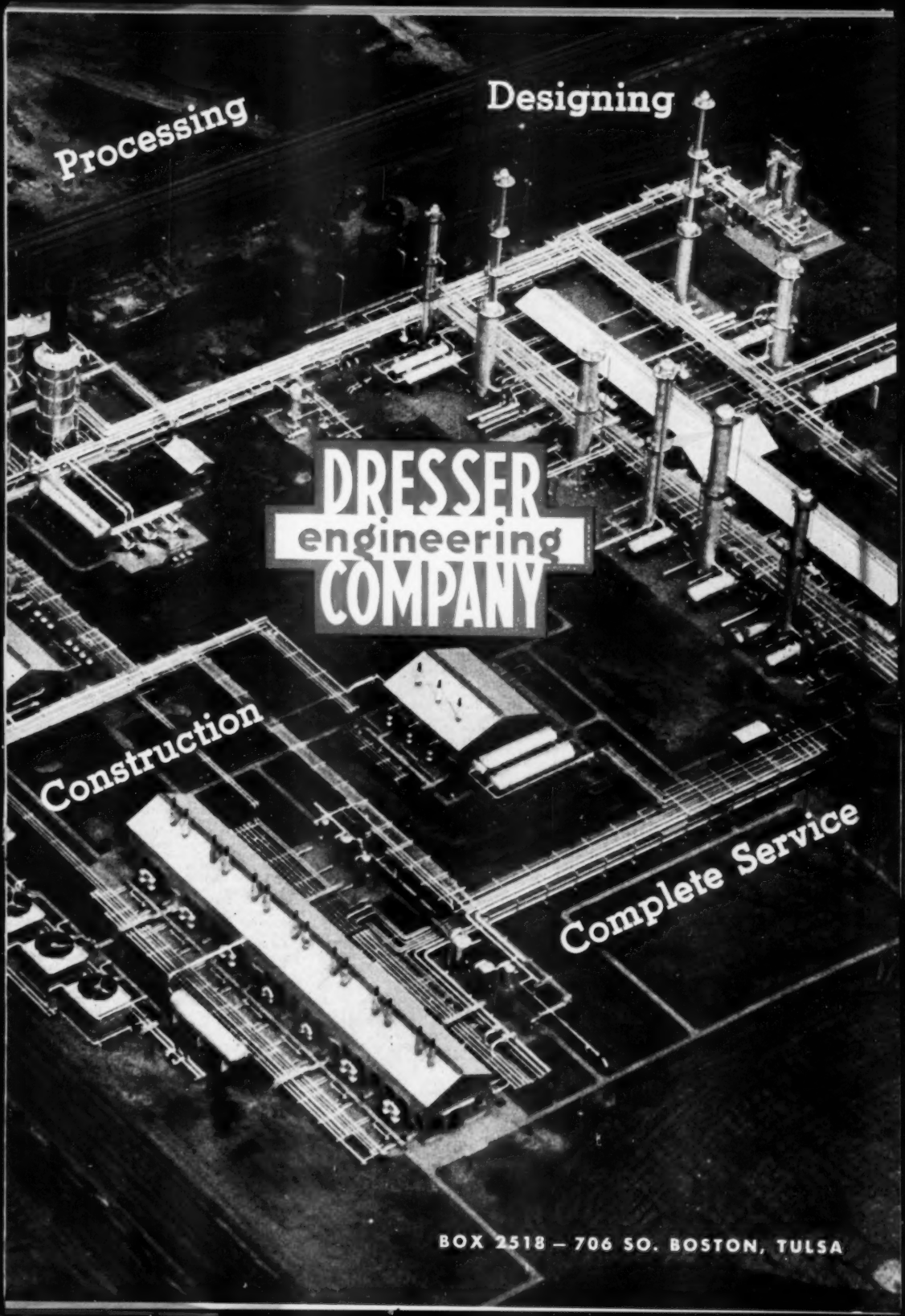
EL JAVALI—Starr, June; The Chicago Corp. 1 Bessie H. Cooke, El Javali Grant, Jackson, 2,223-27 ft., 8,200 M.c.f. of gas, TD 2,510 ft. 2 wells at year end.

EMBELTON—Jim Wells, June; W. Earl Rowe, et al, 1 R. V. Embleton, Los Presenos de Arriba Grant, Blk. 10 of Al Smith Farm Subd., Frio, 3,402-08 ft., 9,800 M.c.f. gas, TD 3,520 ft.

FLORES—Starr, September; Sunray Oil Corp. 1 G. G. Zamora, Sec. 883, Flores Grant, Sullivan, 4,366-79 ft., 150 bbl. cond., TD 6,600 ft.

FULTON BEACH, WEST—Aransas, May; Phillips Petroleum Co. 9 Copano Bay State Tr. 67, located in Copano Bay, Marginulina Frio, 6,660-70 ft., 361 bbl. oil, TD 8,050 ft. 7 wells at year end.

GOVERNMENT WELLS, NORTHWEST—Duval, July; Lundell Brothers 8 E. C. Lundell, J. Poitevent Sur. 364, A-1962, Chernosa, 1,858-63 ft., 32 bbl. oil, TD 1,863 ft.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HIDALGO—Hidalgo, February; The Texas Co. 1 El Texano Land Co., Juan Antonio Villareal Porcion 64, A-41, Frio, 6,240-54 ft., 7,200 M.c.f. gas, TD 12,018 ft.

JONES, EAST—Jim Hogg, September; Sun Oil Co. 13 A. C. Jones, Agua Nueva Abajo Grant, Hockley, 4,909-11 ft., 5,700 M.c.f. gas, TD 4,981 ft. 30 wells at year end.

JONES, NORTH—Jim Hogg, June; Sun Oil Co. 29 A. C. Jones, Agua Nueva de Arriba Grant, A-257, Hockley, 4,943-47 ft., 127 bbl. oil, TD 4,997 ft.

JONES, NORTHEAST—Jim Hogg, March; Sun Oil Co. 13 A. C. Jones, Agua Nueva de Abajo Grant, J. M. Ramirez Sur., A-258, Hockley, 4,789-91 ft., 45 bbl. oil, TD 4,835 ft.

KNOLLE—Nueces, June; Panhandle Producing & Refining Co. 1 Knolle Farms, Bluntzer Partition, Share 9, Frio, 5,162-72 ft., 120,000 M.c.f. gas, TD 5,197 ft. 2 wells at year end.

LEARY-WOOD—Starr, February; O. N. Leary, Trustee, 1 D. G. Wood, Porcion 84, Frio, 1,654-58 ft., 84 bbl. oil, TD 1,837 ft.

LOPEZ, NORTH—Brooks, March; Magnolia Petroleum Co. 7 Duval County Ranch Co., Sec. 196, DCRC Sur. 196, A-853, 2,064-68 ft., 92 bbl. oil, TD 2,105 ft. 8 wells at year end.

LOS TORRITOS—Hidalgo, January; L. M. Lockhart 1 First National Bank of Chicago, Lot 11, Blk. 3, Alamo Land and Sugar Subd., Porcion 72, Frio-Vicksburg, 8,510-26 ft., 150 bbl. cond., TD 8,975 ft.

MILLER RANCH—San Patricio, June; Lee Bros. Oil Co. 1 A. A. Miller, E. J. McCloin Sur., Frio, 3,696-3,704 ft., 85 bbl. oil, TD 4,654 ft. 2 wells at year end.

PARILLA—Duval, April; James Doughty, et al, 1 W. R. Peters, CCD Co. Sur. 66, A-693, Cole, 2,201-20 ft., 40 bbl. oil, TD 2,220 ft.

PATRICK—San Patricio, May; La Gloria Corp. 1 Mary Lou Patrick, Sec. 18, Lot 42, 3rd Addn. of Taft Farm Lands, Frio, 5,916-27 ft., 16,000 M.c.f. gas, TD 6,513 ft.

PORTLAND—San Patricia, March; The Texas Co. 1 Joseph F. Green Estate, T. T. Williams Sur. 39, A-286, Vicksburg, 9,515-24 ft., 28 bbl. oil, TD 11,105 ft.

REDFISH BAY—Nueces, June; Sunray Oil Corp. 1 State Tract 351, Red Fish Bay, Frio, 7,960-72 ft., 174 bbl. oil, TD 8,714 ft. 2 wells at year end.

RICARDO, NORTH—Kleberg, February; C. G. Glasscock 1 J. O. Johnson, Lot 12, Blk. 30, Kleberg Town Improvement Co. Subd., Vicksburg, 7,630-34 & 7,438-44 ft., 90 bbl. oil and 25 bbl. cond., TD 7,734 ft.

ROOTS—San Patricio, April; Rock Hill Oil Co. 1 W. L. Roots, Lot 4, Sec. 24, 4th Addn. of Taft Farm Lands, Frio, 6,042-46 ft., 86 bbl. oil, TD 7,515 ft. 2 wells at year end.

SAN RAMON—Hidalgo, November; Continental Oil Co. 2 P. H. Longoria, et al, Share 7-A San Ramon Grant, A-42, Vicksburg, 8,837-42 ft., 146 bbl. cond., TD 8,950 ft.

SINCLAIR HEIRS—Duval, June; Magnolia Petroleum Co. 2 Sinclair Heirs, AB&M Sur., 499, A-43, Cole, 2,176-69 ft., 28,500 M.c.f. gas, TD 3,264 ft.

STEDMAN ISLAND—Nueces, October; Aransas Dock & Channel Co. 1 Fee, Sur. 652, Marginulina, 7,295-7,311 ft., 210 bbl. cond., TD 8,650 ft.

SULLIVAN—Starr, May; C. G. Glasscock & Selby Walker Co. 1 Yturria Land & Livestock Co., Porcion 43, lower Frio, 5,895-905 ft., 14,500 M.c.f. gas, TD 9,505 ft.

TAL VEZ—Webb, January; Clardy & Barnett 1 O. G. Kirkpatrick, CCSD&RGNG RR Sur. 26, Yegua, 2,295-300 ft., 22 bbl. oil, TD 2,350 ft. 6 wells at year end.

VIRGINIA, NORTH—Aransas, April; Union Producin Co. 4 Virginia H. Tatton, John M. Shreve Sur., A-186, 8,701-21 & 8,736-63 ft., 700 M.c.f. gas, TD 10,496 ft.

WEIL, SOUTH—Jim Hogg, August; Sun Oil Co. 21 Weil Bros., Santo Domingo de Abajo Grant, Hockley, 4,123-32 ft., 40 bbl. oil, TD 5,705 ft.

UNNAMED—Aransas, November; C. G. Glasscock and Pontiac Refining Co. 1 State Tract 48, Copano Bay, 6,295-300 ft., 140 bbl. oil, TD 8,194 ft.

UNNAMED—Brooks, April; The Chicago Corp. 2 Brijido Ramirez, La Encantada & Encino del Pozo Grant, Frio, 4,716-23 ft., 15 bbl. oil, TD 4,723 ft.

UNNAMED—Brooks, October; Howeth & Mason 1 Mrs. Emily McLeod, S. Alacon Sur. 312, 2,186-92 ft., 55 bbl. oil, TD 3,894 ft.

UNNAMED—Brooks, December; Humble Oil & Refining Co. G-1 Mestena Oil & Gas Co., W. W. Jones Subd., La Mestena Y Gonzalena Grant, 6,114-24 ft., 131 bbl. oil, TD 8,514 ft.

UNNAMED—Duval, August; F. William Carr, et al, 1 A. G. Black, Pedro de la Cerda Sur., lower Pettus, 4,432-36 ft., 88 bbl. oil, TD 4,437 ft.

UNNAMED—Hidalgo, May; The Texas Co. 1 Pate Gas Unit, Antonio Guiterrez Sur., Porcion 63, 6,253-63 ft., 7,000 M.c.f. gas, TD 8,000 ft.

UNNAMED—Jim Hogg, April; Sun Oil Co 11 A C Jones, Agua Nueva de Abajo Grant, Hockley, 4,574-32 ft, 117 bbl. oil, TD 4,610 ft.

UNNAMED—Jim Wells, June; Arnold O. Morgan 1 Charles Hoelscher, Share 5-A, Los Presenos de Abaja Grant, Heterostegina, 3,630-34 ft., gas well, no gage, TD 3,690 ft.

UNNAMED—Jim Wells, September; Paisano Trading Co., Ltd., & G. Ray Boyd 1 Bruno Goldapp, Waldron Subd. of S. Sherman Sur. 25, A-427, 3,388-3,400 ft., 37,500 M.c.f. gas, TD 6,395 ft.

UNNAMED—Jim Wells, October; Barron Kidd 1 M. E. Dilworth, S.A.&M.G. RR Sur. 87, 5,018-23 ft., 52 bbl. oil, TD 5,084 ft.

UNNAMED—Jim Hogg, October; H. L. Hunt 1 Lawrence R. Brooks, Santo Domingo de Abajo Grant, Blk. 6, 3,673-77 ft., 146 bbl. oil, TD 4,721 ft.

UNNAMED—Kenedy, August; Humble Oil & Refining Co. E-1 John G. Kenedy, Jr., El Paistle Grant, 10,000 M.c.f. gas, TD 11,794 ft.

UNNAMED—Nueces, June; Forest Oil Corp. 1 May Dunn Wagner, Lot 17, Sec. 40, Flour Bluff and Encinal Farm & Garden Tracts, Frio, 6,629-35 ft., 17,200 M.c.f. gas, TD 7,005 ft.

UNNAMED—Nueces, August; Stanolind Oil & Gas Co. 1 State Tract 421, in Corpus Christi Bay, Tract 421, 7,285-90 ft., 203 bbl. oil, TD 9,521 ft.

UNNAMED—Nueces, September; Renwar Oil Corp. & Phillips Petroleum Co. 1 J. C. Blacknall, O. R. Warner Sur. 74, 6,098-6,101 ft., gas well, no gage, TD 6,500 ft.

UNNAMED—Nueces, September; Sam E. Wilson, Jr., and Renwar Oil Corp. 1 State of Texas, Tract 462-A, Corpus Christi Bay, 8,453-55 ft., 75 bbl. cond., TD 10,716 ft.

UNNAMED—Nueces, October; Atlantic Refining Co. 1 C. J. Horne, Sec. 24, R de Ynojosa Sur., A-411, 9,880-9,910 ft., 65 bbl. cond., TD 10,300 ft.

UNNAMED—Nueces, November; Stanolind Oil & Gas Co. 1 State Tract 414, in Corpus Christi Bay, 8,002-114 ft., 55 bbl. of oil, TD 8,309 ft.

UNNAMED—San Patricio, January; Phillips Petroleum Co. 1 Turk (State Lease 50398), John Smith Sur., A-234, lower Frio, 9,480-90 & 9,520-50 ft., 72 bbl. cond., TD 9,644 ft.

UNNAMED—San Patricio, February; J. W. Gorman B-1 Cox, M., J., and W. Delgado Sur., A-4, Stilwell-Vicksburg, 5,121-26 ft., 55,000 M.c.f. gas, TD 5,206 ft.

UNNAMED—San Patricio, October; Plymouth Oil Co. F-8 E. H. Welder, Sec. 31, Welder Ranch Subd., 3,638-40 ft., 622 M.c.f. gas, TD 7,420 ft.

UNNAMED—Starr, February; Sun Oil Co. 10 A. C. Jones, Agua Nueva de Abajo grant, CCSD&RGNG RR Sur. 275, Yegua, 4,602-05 ft., 137 bbl. oil, TD 4,796 ft.

UNNAMED—Starr, May; Bass & Vessels 1 Gregoria Garcia, et al, Sec. 6-B, Santa Cruz Grant, Frio, 4,614-50 ft., 2,900 M.c.f. gas, TD 6,005 ft.

UNNAMED—Starr, May; Sun Oil Co. 3 A. C. Jones-State, Antonio Garza Acevedo Sur. 10, Hockley, 4,657-61 ft., 131 bbl. oil, TD 4,668 ft.

UNNAMED—Starr, August; Sun Oil Co. 1 Hinojosa, Santa Cruz Grant, 6,133-45 ft., 11,000 M.c.f. gas, TD 6,939 ft.

UNNAMED—Starr, September; The Chicago Corp. 16 Slick Estate, Los Maguelles Grant, 4,761-64 ft., 6,400 M.c.f. gas, TD 5,000 ft.

UNNAMED—Starr, November; Geo. E. Wrather Oil Co. & Bass-Vessels 1 Hilaria A. De Garza, Santa Cruz Grant, Tract 7, 5,941-52 ft., 66 bbl. oil, TD 6,509 ft.

UNNAMED—Zapata, August; Earl A. Thompson 2 M. Garza, Sur. 284, 1,665-70 ft., 4,850 M.c.f. gas, TD 1,675 ft.

UNNAMED—Zapata, December; The Texas Co. 1 Fernando Cuellar, et al, E. & F. Cuellar Sur., A-208, 3,020-30 ft., 123 bbl. oil, TD 7,610 ft.

NEW PAYS

AMARGOSA—Jim Wells, January; George W. Graham A-2 Lester Moore, J. Poitevent Sur. 97, A-185, Yegua, 6,095-102 ft., 10 bbl. oil, TD 6,808 ft. 2 wells at year end.

BISHOP, WEST—Nueces, July; Eastern States Petroleum Co., Inc., 1 H. A. Pearson, F.Z. Bishop Subd. of Weil Ranch, Pfluger (Frio), 7,231-46 ft., 11,500 M.c.f. gas, TD 7,805 ft.

BLACKJACK—Aransas, September; Western Natural Gas Co. 14 St. Charles Ranch Co., Isaac Dowers Sur., A-53, Frio "B," 11,460-90 ft., 3,270 M.c.f. gas, TD 11,615 ft.

CECIL—Hidalgo, April; Taylor Refining Co. 1 Garcia Land & Livestock Co., Porcion 42, Vicksburg, 3,974-92 ft., 38 bbl. oil, TD 8,208 ft. 2 wells at year end.

DAGGER ISLAND—Nueces, June; Atlantic Refining Co. 1 State Tract 398, State Tract 398 in Redfish Bay, 7,942-58 ft., 123 bbl. oil, TD 8,252 ft.

DAGGER ISLAND—Nueces, June; Sunray Oil Corp. 1 State Tract 352, State Tract 352, Red Fish Bay, Frio, 7,220-42 ft., 3,770 M.c.f. gas, TD 9,009 ft.

DAGGER ISLAND—Nueces, July; Sunray Oil Corp. 1 State Tract 396, Tract 396 in Redfish Bay, 8,330-37 ft., 199 bbl. oil, TD 8,337 ft. 3 wells at year end.

DAGGER ISLAND—Nueces, August; Sunray Oil Corp. 1 State Tract 395, State Tract 395 in Corpus Christi Bay, 8,018-25 ft., 162 bbl. oil, TD 8,400 ft.

EAGLE HILL—Duval, January; Ralph E. Fair-Woodward & Co. 1 J. R. Foster Unit 1, Charles Adami Sur. 206, A-1641, Wilcox, 7,116-30, 7,154-70, 7,208-19 and 7,334-36 ft., 10,000 M.c.f. gas, TD 7,892 ft.

EAGLE HILL—Duval, July; Magnolia Petroleum Co. 48 Duval Ranch, Sec. 201, Wilcox, 7,299-318 ft., 280 M.c.f. gas, TD 10,000 ft. 2 wells at year end.

EDINBURG—Hidalgo, January; Magnolia Petroleum Co. 1 Julia Gannaway, Lot 3, Tex-Mex RR Sur. 273, lower Frio, 7,788-98 ft., 8,500 M.c.f. gas, TD 8,260 ft.

EL JAVALI—Starr, October; The Chicago Corp. B-2 Bessie H. Cocke, El Javali Grant, Share 3, 2,315-23 ft., 19 bbl. oil, TD 3,388 ft.

FLOUR BLUFF, EAST—Nueces, November; Humble Oil & Refining Co. F-2 East Flour Bluff State, in Laguna Madre Bay State Tract 31, 8,730-45 ft., 33,000 M.c.f. gas, TD 9,298 ft.

FULTON BEACH—Aransas, April; Sun Oil Co. 1 Copano State Tract 74, in Copano Bay, State Tract 74, Frio, 7,166-71 ft., 76 bbl. oil, TD 7,197 ft. 10 wells at year end.

FULTON BEACH—Aransas, May; Sun Oil Co. 1 Copano Bay State Tract 76, Copano Bay, Frio, 7,126-30 ft., 171 bbl. oil, TD 7,443 ft. 10 wells at year end.

HAGIST RANCH—Duval, April; The Texas Co. 1 Hagist Ranch, Inc., Z. Benson Sur. 268, A-1633, Frio, 834-46 ft., 362 M.c.f. gas, TD 7,456 ft.

HARVEY—San Patricio, February; LaGloria Corp. 2 J. S. Harvey, Block 9, Rincon Road Subd., Frio, 8,102-10 ft., 60 bbl. oil, TD 9,285 ft.

HARVEY—San Patricio, February; LaGloria Corp. 3 J. H. Harvey, Blk. 9, Rincon Road Subd., Vicksburg, 8,630-35 ft., 208 bbl. oil, TD 9,353 ft. 2 wells at year end.

HARVEY—San Patricio, May; LaGloria Corp. 1 Ray & Harvey, Lot 8, Blk. 63, 5th Addn. to Taft Farm Lands, 13-C Frio, 8,716-34 ft., 150 bbl. oil, TD 10,120 ft. 4 wells at year end.

HOLLOW TREE—Jim Wells, February; The Texas Co. 3 H. M. Cornelius, S.P. RR Sur. 17, Frio, 3,472-82 ft., 85 bbl. of oil, TD 4,302 ft. 6 wells at year end.

LABBE—Duval, October; Lewis Kelsey & W. H. Martin 1 Labbe Bros., J. Poitevent Sur., Sec. 221, 2,792-95 ft., 51 bbl. oil, TD 2,850 ft.

LACY—Hidalgo, February; Hydrocarbon Production Co., Inc., 1 Schwarz-Ritcheson,

Lot 4, Blk. 24, Capisallo District Subd., Frio "A," 7,230-43 ft., 5,800 M.c.f. gas, TD 7,545 ft. 3 wells at year end.

LOE TORRITOS—Hidalgo, May; Taylor Refining Co. & Mayflower Minerals Corp. 1 Boris Marinoff, Lot 85, Santa Anna Development Co., Unit, Porcion 72, Frio, 5,850-56 ft., 257 bbl. cond., TD 9,016 ft.

LOS TORRITOS—Hidalgo, August; Taylor Refining Co. and Mayfair Minerals, Inc., 1 William Brewster, Los Torritos Grant, 6,746-51 ft., 12,000 M.c.f. gas, TD 9,496 ft.

LOU ELLA—Jim Wells, June; Daubert & Achning 8 Lou Ella Wade, Lot 1, Great Block 5, Casa Blanca Grant, A-296, Stillwell, 5,111-17 ft., 57,000 M.c.f. gas, TD 5,128 ft. 6 wells at year end.

MARKS—Starr, June; The Texas Co. 4 W. D. Hornaday, El Javali Juan Flores Heirs Sur., 2,064-71 ft., 165 bbl. oil, TD 2,071 ft. 16 wells at year end.

MIDWAY—San Patricio, April; F. M. Baykin, Jr., A-1 A. W. Scrivner, Sec. "J" of G. H. Paul Subd., Coleman-Fulton Pasture Co. Lands, Frio, 6,615-16 ft., 76 bbl. oil, TD 8,702 ft. 2 wells at year end.

MUD FLATS—San Patricio, March; Sun Oil Co. 1 Milton Gabriel, Sec. 55 and 56, 6th Subd. of Taft Farm Lands, Frio, 9,018-28 ft., 11 bbl. oil, TD 10,015 ft.

NUECES BAY—Nueces, March; Erie P. Halliburton Co. 1 State Tract 723, Nueces Bay State Tract 723, Catahoula, 3,764-68 ft., 100,000 M.c.f. gas, TD 4,045 ft. 3 wells at year end.

NUECES BAY—Nueces, July; The Texas Co. 1 State Tract 708, Nueces Bay-State Tract 708, 4,984-90 ft., 118 bbl. oil, TD 4,041 ft.

NUECES BAY, WEST—San Patricio, June; Humble Oil & Refining Co. 1 Fanny D. Wilson, J. F. Smith Sur. A-153, Vicksburg, 8,405-20 ft., 188 bbl. oil, TD 8,700 ft.

PORTILLA—San Patricio, March; Superior Oil Co. 26 Minnie S. Welder, Sec. 19, Welder Ranch Subd., Frio-Vicksburg, 7,448-56 ft., 325 bbl. oil, TD 9,000 ft.

PORTILLA—San Patricio, May; Superior Oil Co. 29 Minnie S. Welder, Sec. 19, Welder Ranch Subd., 8,642-68 ft., 160 bbl. oil, TD 9,150 ft. 3 wells at year end.

PORTILLA—San Patricio, December; Plymouth Oil Co. G-3 R. H. Welder, E. H. Welder Sur., Sec. 33, 7,118-23 ft., 305 bbl. oil, TD 8,214 ft.

RACHAL—Brooks, July; Humble Oil & Refining Co. 1 Lucas Ramirez Est., Share 14, Block 3-A "La Encantada Grant, Frio, 4,801-06 ft., 8 bbl. oil, TD 6,600 ft.

RED FISH BAY—Nueces, August; Atlantic Refining Co. 1 State Tract 413, State Tract 413, Corpus Christi Bay, 7,950-60 ft., 108 bbl. oil, TD 8,400 ft. 3 wells at year end.

RED FISH BAY—Nueces, October; Atlantic Refining Co. 1 State 411, in Red Fish Bay, 7,174-80 & 7,130-40 ft., 15,000 M.c.f. gas, TD 8,500 ft.

ROOKS—San Patricio, May; Plymouth Oil Co. F-5 E. H. Welder, Sec. 30, E. H. Welder Ranch Subd., Heep (Frio), 5,809-11 ft., 108 bbl. oil, TD 9,437 ft.

SARITA—Kenedy, October; Humble Oil & Refining Co. B-28 John G. Kenedy, Jr., El Paistle Grant, 6,432-31 ft., 107 bbl. oil, TD 9,500 ft.

SINTON, NORTH—San Patricio, April; Plymouth Oil Co. B-3 R. H. Welder, Frio, 5,620-30 ft., 66 bbl. oil, TD 6,607 ft. 6 wells at year end.

SINTON, WEST—San Patricio, June; Wymore Oil Co. 1 Lillie Caddell, John Pollan League, Catahoula, 3,378-81 ft., 63 bbl. oil, TD 4,475 ft.

SULLIVAN—Starr, June; The Chicago Corp. A-2 State-Slick, J. T. McCarty Sur. 885, Frio, 4,342-51 ft., 14,500 M.c.f. gas, TD 5,911 ft.

SULLIVAN—Hidalgo, July; The Texas Co. 1 Yturria Land & Livestock Co., Antonio Miguel Cano Sur., A-81, Vicksburg, 4,386-92 ft., 78,000 M.c.f. gas, TD 6,715 ft.

SUN, NORTH—Starr, January; Bass & Vessels 1 Arturo Pena Heirs, Santa Teresa Grant, Frio, 5,535-41 ft., 53 bbl. oil, TD 6,001 ft.

TAFT—San Patricio, July; Atlantic Refining Co. 1 W. L. Roots, Sec. 24, 4th Addn. to Taft Farm Lands, Frio, 6,397-402 ft., 97 bbl. oil, TD 7,008 ft.

WELDER-DURHAM—San Patricio, February; Seaboard Oil Co. of Delaware 4 R. H. Welder, Sec. 38, E. H. Welder Ranch Subd., 6,146-50 ft., 159 bbl. oil, TD 6,150 ft. 2 wells at year end.

EAST TEXAS
Districts 5 and 6
NEW POOLS

BIG MINERAL CREEK—Grayson, May; Fred Snuggs & Neal 1 Q. Little, William Allen Sur., A-15, Pennsylvanian, 3,618-29 ft., 157 bbl. of oil, TD 3,629 ft. 3 wells at year end.

DEUPREE—Wood, September; F. R. Jackson 1 E. A. Byers, R. C. Ramsey Sur., Woodbine, 5,738-48 ft., 136 bbl. of oil, TD 6,843 ft. 5 wells at year end.

DOBBS—Wood, August; A. O. Phillips 1 D. E. Dobbs, Thomas Walker Sur., Sub-Clarksville, 5,541-50 ft., 276 bbl. of oil, TD 6,135 ft.

FLETCHER—Falls, March; E. Fletcher 1 G. L. Storey, R. S. Hunnicutt Sur., Buda lime, 1,302-23 ft., 202 bbl. of oil, TD 1,323 ft.

FORAN—Leon, October; Humble Oil & Refining Co. 1 Lester Foran, T. Ross & J. Harrington Sur., Woodbine, 5,738-60 ft., 10,000 M.c.f. of gas, 6 bbl. cond., TD 10,610 ft.

HAM GOSSETT (GLEN ROSE, RODESSA)—Kaufman, March; T. D. Humphrey 1 Annie M. Fritz, E. Fitzgerald Sur., upper Glen Rose 5,780-85 ft., upper Rodessa 6,223-39 ft., 467 bbl. of oil, TD 6,800 ft. 30 wells at year end.

McMILLAN-OIL CREEK—Grayson, April; L. O. McMillan 1 O. B. Rich, R. H. Armstrong Sur., A-53, Oil Creek sand, 8,233-36 ft., 415 bbl. of oil, TD 8,237 ft. 3 wells at year end.

OLETHA—Limestone, April; The Texas Co. 1 Lula Mason, J. L. Chavert Sur., Ro-

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President

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dessa, 6,788-6,804 ft., 368 bbl. of cond., TD 8,389 ft.

PINE MILLS, WEST—Wood, March; Palmer Drilling Co. 1 Slayton, S. Holman Sur., sub-Clarksville, 4,994-5,004 ft., 310 bbl. of of oil, TD 6,115 ft.

SADDLER PENNSYLVANIAN—Grayson, September; Mid-Continent Petroleum Corp. 1 Susie Martin, I. B. Walker Sur., Pennsylvanian, 6,912-93 ft., 252 bbl. of oil, TD 6,993 ft. 2 wells at year end.

SHERMAN, NORTH—Grayson, August; Standard Oil Co. of Texas 1 S. F. McKeon, A. Humes Sur., A-522, Strawn sand, 5,131-41 ft., 67 bbl. of oil, TD 6,000 ft.

SPENCE—Houston, August; Morris Coats & Ralph Spence 1 O. M. Rialls, D. McLean Sur., A-56, sub-Clarksville, 5,762-78 ft., 128 bbl. of cond., TD 6,043 ft.

WOODLAWN—Harrison, April; Hollandsworth Oil Co. 3 Frank Davis, R. S. Smith Sur., Pettit, 6,467-77 ft., 237 bbl. of oil, TD 6,581 ft. 16 wells at year end.

UNNAMED—Anderson, April; Continental Oil Co. 1 Frank H. Carroll, Juan A. Aquillers Sur., Rodessa, 8,796-8,806 ft., 485 bbl. of cond., TD 9,886 ft.

UNNAMED—Anderson, April; D. A. McCrary 1 Southern Pine, T. M. Jones Sur., Woodbine, 5,275-76 ft., 49 bbl. of oil, TD 5,329 ft.

UNNAMED—Rains, May; R. J. Caraway 1 H. L. Puckett, J. R. Dyer Sur., Buckner, 11,958-12,126 ft., 203 bbl. of cond., TD 12,602 ft.

UNNAMED—Marion, July; Natchez Producing Co. 1 Dollie Key, Wm. Mason Sur., Pettit, 6,404-30, 6,450-98 ft., 3,000 bbl. cond., TD 6,565 ft.

UNNAMED—Anderson, September; The Texas Co. 1 C. W. Hanks, Isaac Lindsey Sur., Glen Rose, 10,094-104 ft., 120 bbl. of cond., TD 10,758 ft.

UNNAMED—Cherokee, September; L. W. Dennis and Eugene Hunger 1 Newburn, F. J. Anthony Sur., Woodbine, 4,350-53 ft., 500 bbl. of cond., TD 4,371 ft.

UNNAMED—Rusk, November; Clark & Stone 1 Kangera Bros., W. R. Moore Sur., Woodbine, 3,815-25 ft., 85 bbl. of oil, TD 3,825 ft.

NEW PAYS

HAM-GOSSETT—Kaufman, April; Vernon Whiteley Drilling Co. 1 J. M. Tuggle, E. Fitzgerald Sur., Hill sand, 6,186-6,244 ft., 453 bbl. of oil, TD 6,411 ft.

HAM-GOSSETT—Kaufman, April; T. D. Humphrey 2 Anna M. Fritz, E. Fitzgerald Sur., A-150, Woodbine, 4,021-30 ft., 319 bbl. of oil, TD 4,030 ft.

HAM-GOSSETT—Kaufman, June; Vernon Whitley 1-A Tuggle, E. Fitzgerald Sur., Bacon lime, 5,810-15 ft., 105 bbl. of oil, TD 6,124 ft.

HAM-GOSSETT—Kuafman, August; T. D. Humphrey 7 A. M. Fitz, E. Fitzgerald Sur., Woodbine, 3,704-10 ft., 230 bbl. of oil, TD 6,273 ft.

HAM-GOSSETT - WOODBINE—Kaufman, August; Humble Oil & Refining Co. 1-T Hardy, E. Fitzgerald Sur., Woodbine, 3,637-44 ft., 282 bbl. of oil, TD 4,106 ft.

HAM-GOSSETT-LEWISVILLE—Kaufman, October; Humble Oil & Refining Co. 2-B Tuggle, E. Fitzgerald Sur., Lewisville, 3,238-41 ft., 105 bbl. of oil, TD 3,890 ft.

SHERMAN—Grayson, June; Mott & Bratton 1 J. H. Caraway, J. B. McNair Sur., A-763, lower Strawn, 4,887-98 ft., 117 bbl. of oil, TD 4,905 ft.

WALTER FAIR—Kaufman, September; Production Investment Corp. 1 F. E. Lumpkin, B. S. Newman Sur., Rodessa, 6,364-72 ft., 139 bbl. of oil, TD 6,870 ft.

WASKON—Harrison, August; Bert Fields 1 Wellborne Heirs, Wm. Tiller Sur., Travis Peak, 6,186-91 ft., 97 bbl. of oil, TD 6,245 ft.

WEST TEXAS

Districts 7-C and 8

NEW POOLS

ABELL-McKEE, SE—Pecos, September; Murphy Corp. 1 R. D. Blaydes, 19-2-H&TC, Ellenburger, 5,837-58 ft., 102 bbl. of oil, TD 5,982 ft. 2 wells at year end.

ABELL, SE (CLEAR FORK)—Pecos, June; Wood River Oil & Refining Co. 2 J. Williams, 4-3-H&TC, Clear Fork, 3,850-99 ft., 126 bbl. of oil, TD 5,265 ft. 5 wells at year end.

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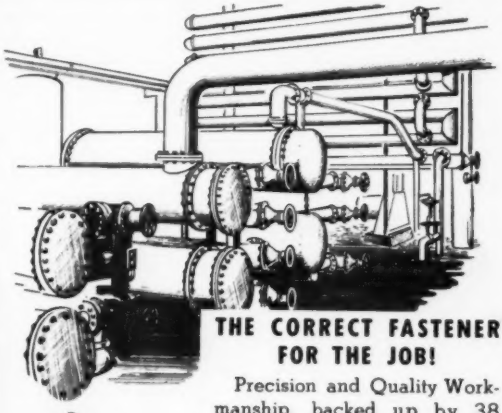

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ALDWELL—Reagan, June; Paul F. Barnhart 1-15 Wimberly, 15-C-LS&V, Spraberry, 6,795-6,900 ft., 176 bbl. of oil, TD 6,900 ft. 5 wells at year end.

AZTEC—Runnels, November; Aztec Oil Co. 1 Nettie Currie, Sec. 163, ETRR Sur., Palo Pinto, 3,425-56 ft., 179 bbl. of oil, TD 4,630 ft.

BATEMAN RANCH, EAST—King, February; Ohio Oil Co. 1-D W. R. Ross, 134-A-J. B. Rector Sur., Strawn, 5,320-32 ft., 114 bbl. of oil, TD 5,402 ft. 2 wells at year end.

BAUGH—Schleicher, January; Westbrook Oil Co. 1-A A. L. Baugh, 8-M-GH&SA, Strawn, 5,728-58 ft., 14 bbl. cond., 10,000,000 cu. ft. gas, TD 5,790 ft.

BEAN—Crockett, August; Malco Refineries, Inc., 1 George Bean, 34-UV-GC&SF, Greyburg, 1,460-67 ft., 50 bbl. of oil, TD 1,467 ft.

BRADEN—Upton, February; Ted Weiner 1-17 F. A. Braden, 17-37-T5S-T&P, Spraberry, 6,986-96 ft., 452 bbl. of oil, TD 7,180 ft. 3 wells at year end.

BREEDLOVE—Martin, July; Pan-American Producing Co. 1 F. D. Breedlove, League 258, Briscoe CSL, Devonian, 12,078-12,118 ft., 2,341 bbl. of oil, TD 13,053 ft.

BROWN & THORP—Pecos, September; Brown & Thorp Drilling Co. 1 G. R. White-Gulf, 39-11-H&GN, Clear Fork, 3,028-51 ft., 194 bbl. of oil, TD 3,051 ft. 3 wells at year end.

BRUSHY TOP—Sutton, January; C. L. Norsworthy, Jr. 1 R. M. Thomson, 67-A-HE&WT, Permian, 952-984 ft., 56 bbl. of oil, TD 7,441 ft. 5 wells at year end.

CAMPBELL—Reeves, April; Francis K. Campbell 1 J. M. Hickey & Sons, 17-56-PSL, Castile, 1,923-65 ft., 28 bbl. of oil, TD 3,186 ft.

CLARA COUCH-CANYON—Crockett, May; Cities Service Oil Co. 1-E J. W. Owens, 14-GG-GC&SF, Canyon lime, 6,270-75 ft., 90 bbl. cond., TD 6,733 ft. 6 wells at year end.

COGDELL-FULLER—Scurry, May; The Texas Co. 156-F Fuller, 652-97-H&TC, Fuller sand, 5,149-69 ft., 630 bbl. of oil, TD 5,350 ft. 13 wells at year end.

DEAN—Dawson, April; James H. Snowden 1-30 Carrie S. Dean, 30-1-J. Poitevent Sur., Spraberry, 7,288-98 ft., 160 bbl. of oil, TD 8,634 ft. 2 wells at year end.

DEAN "32"—Dawson, June; James H. Snowden 1-32 Carrie S. Dean, 32-1-J. Poitevent Sur., Spraberry, 7,394-7,417 ft., 44 bbl. of oil, TD 8,700 ft.

DRIVER—Midland, January; Ted Weiner 1-16 J. W. Driver, 16-37-T4S-T&P, Spraberry, 7,110-7,325 ft., 304 bbl. of oil, TD 7,325 ft. 127 wells at year end.

ELKHORN—Crockett, July; Continental Oil Co. 1 J. M. Shannon "A," 22-UV-GC&SF, Ellenburger, 7,185-7,236 ft., 2,580 bbl. of oil, TD 7,236 ft. 5 wells at year end.

EPPENAUER—Crane, November; Placid Oily Co. et al 1 A. R. Eppenauer, 14-6-H&TC, Devonian, 5,205-5,362 ft., 40 bbl. of oil, TD 5,395 ft. 4 wells at year end.

FASKEN—Andrews, April; Anderson-Prichard Oil Corp. 1 Fasken J-26, 26-41-T1N-G&MMB&A, Grayburg, 4,657-4,775 ft., 298 bbl. of oil, TD 4,775 ft.

FLAT ROCK - ELLENBURGER—Upton, January; Cities Service Co. and Continental 1-A. H. University, 3-29-University Lands, Ellenburger, 10,855-76 ft., 2,044 bbl. of cond., TD 11,281 ft. 2 wells at year end.

FLAT ROCK-SPRABERRY—Upton, July; Cities Service Oil Co. 1-AM University, 32-3-University Lands, Spraberry, 7,088-7,138 ft., 103 bbl. of oil, TD 11,097 ft. 2 wells at year end.

FLOREY—Andrews, September; Magnolia Petroleum Co. 1 Tom Peay, 6-314-Gaines CSL, Wolfcamp, 9,227-9,308 ft., 375 bbl. of oil, TD 14,085 ft.

FORT CHADBOURNE, WEST—Coke, January; Humble Oil & Refining Co. 9 Sallie Odom, Seth Clark Sur. 475, Strawn, 4,974-80 ft., 634 bbl. of oil, TD 5,545 ft. 12 wells at year end.

GIDNEY—Reagan, August; James H. Snowden 1-37 E. D. Gidney, 37-36-T5S-T&P, Spraberry, 6,447-95 ft., 225 bbl. of oil, TD 6,495 ft.

GLASS-PENNSYLVANIAN—Martin, May; Gulf Oil Corp. 2-E G. W. Glass, 12-39-T1N-T&P, Pennsylvanian, 10,450-10,530 ft., 552 bbl. of oil, TD 12,661 ft. 2 wells at year end.

GLASS-SPRABERRY—Martin, February; Gulf Oil Corp. 1-E-B G. W. Glass, 13-39-T1N-T&P, Spraberry, 8,665-8,705 ft., 100 bbl. of oil, TD 12,915 ft.

HARRIS—Crockett, February; Continental Oil Co. 1 C. T. Harris, 15-3-WCRR, Devonian, 8,610-22 ft., 1,099 bbl. of oil, TD 8,685 ft. 10 wells at year end.

HERMLEIGH—Scurry, June; R. Olsen Oil Co. 1 J. W. Templeton, 52-3-H&TC, Ellenburger, 7,390-7,435 ft., 219 bbl. of oil, TD 7,435 ft.

HI LONESOME-BEND—Midland, July; The Texas Co. 1-D Clarence Scharbauer, 19-39-T2S-T&P, Pennsylvanian, 9,560-9,730 ft., 85 bbl. of oil, TD 10,750 ft.

HI LONESOME, SOUTH—Midland, November; The Texas Co. 1-B Scharbauer, 43-39-T2S-T&P, Spraberry, 7,770-8,050 ft., 40 bbl. of oil, TD 8,050 ft.

HOUSE—Gaines, September; Union Oil Co. of California 2 T. C. Weltmer, 16-A12-PSL, Clear Fork, 7,128-41 ft., 99 bbl. of oil, TD 7,144 ft.

HULLDALE, NORTH—Schleicher, February; Hiawatha Oil & Gas Co. 1 J. F. Runge, 66-M-GH&SA, Lower Canyon, 5,612-20 ft., 471 bbl. of oil, TD 5,675 ft. 2 wells at year end.

JENKINS-SAN ANDRES—Gaines, January; The Texas Co. 1 Southland Royalty Co., 7-A25-PSL, San Andres, 4,543-4,820 ft., 116 bbl. of oil, TD 9,173 ft. 3 wells at year end.

JUSTICEBURG, WEST—Garza, February; Tobe Foster 1 Justice Heirs, 19-6-H&GN, Strawn, 7,451-56 ft., 155 bbl. of oil, TD 7,834 ft.

KELLY-SNYDER BROWN—Scurry, June; Standard Oil Co. of Texas 3 Mrs. Jessie Brown, 440-97-H&TC, Cisco sand, 6,180-6,222 ft., 152 bbl. of oil, TD 6,222 ft.

KELLY-SNYDER—Scurry, April; Standard Oil Co. of Texas 19 C. E. Parks, 447-97-H&TC, Cisco sand, 6,120-6,202 ft., 209 bbl. of oil, TD 6,906 ft. 5 wells at year end.

KETCHUM—Tom Green, April; American Republics Corp. 1 Mrs. M. V. Ketchum, J. O. White Sur. 7, Ellenburger, 5,687-5,710 ft., 19 bbl. of oil, TD 5,738 ft.

KINGSLEY—Irion, October; Moore Ex-

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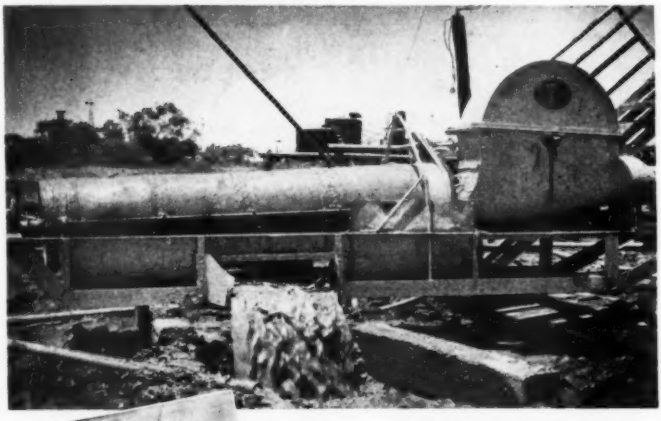

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ploration Co. 1 W. M. Noelke, 1,150-A-W. H. Smith Sur., Ellenburger, 7,806-38 ft., 250 bbl. of oil, TD 7,838 ft.

LEAMAN LIME—Ward, November; Max Leaman 1 E. H. Cary, D. K. Taylor Sur., Yates sand, 2,586-87 ft., 245 bbl. of oil, TD 2,587 ft.

LYGAY-CADDO—Coke, June; Al G. Hill 2 R. H. Harris, Winfield Scott Sur. 10, Caddo, 6,771-75 ft., 104 bbl. of oil, TD 7,270 ft.

McCUTCHEN-CISCO—Coke, January; Union Oil Co. of California 3 Jim McCutchen, 444-1A-H&TC, Cisco, 3,985-98 ft., 277 bbl. of oil, TD 4,010 ft. 10 wells at year end.

MILLER—Borden, June; Stanolind Oil & Gas Co. 1 J. E. Miller, 3-30-T5N-T&P, Spraberry, 5,256-90, 5,310-30 ft., 121 bbl. of oil, TD 8,645 ft.

NEVA, WEST—Schleicher, August; W. W. West 1 Mrs. Christina Mittel, 77-TT-TCRR, Strawn reef, 6,317-37 ft., 583 bbl. of oil, TD 6,372 ft.

PARKS-PENNSYLVANIAN—Midland, January; Magnolia Petroleum Co. 1 H. S. Collings, Sec. 7, M. Daugherty Sur., Pennsylvanian, 10,375-95, 10,400-25 ft., 567 bbl. of oil, TD 13,302 ft. 15 wells at year end.

PATSY—Runnels, March; CB Drilling Co. 1 W. M. Ashton, H. Garmes Sur. 540, Swastika sand, 2,533-39 ft., 42 bbl. of oil, TD 2,550 ft. 6 wells at year end.

PFLUGER—Concho, January; C. B. Drilling Co. 1 Walter Pfluger, A. Sator Sur. 2,088, Canyon reef, 2,121-24 ft., 102 bbl. of oil, TD 2,124 ft. 6 wells at year end.

RUNGE—Schleicher, February; Hiawatha Oil & Gas Co. 1 J. F. Runge, 66-M-GH&SA, Canyon, 5,612-20 ft., 471 bbl. of oil, TD 5,675 ft.

SCHROCK — Midland, April; James H. Snowden 1-34 W. M. Schrock, 34-37-T4S-T&P, Spraberry, 7,011-50 ft., 394 bbl. of oil, TD 7,075 ft.

SMITH-SAN ANDRES — Andrews, July; Neville G. Penrose, Inc. 1 Lydia Littman, 6-A29-PSL, San Andres, 4,313-39 ft., 55 bbl. of oil, TD 4,339 ft.

SUGG-CLEAR FORK—Reagan, October; Atlantic Refining Co. 1-B Sugg, 135-2-T&P, Clear Fork, 5,495-5,550 ft., 405 bbl. of oil, TD 5,550 ft.

SUGG-WOLFCAMP — Reagan, September; Atlantic Refining Co. 1 J. D. Sugg 134-2-T&P, Wolfcamp, 8,095-8,120 ft., 103 bbl. of oil, TD 10,285 ft.

TABLE MOUNTAIN—Runnels, May; Mid-Continent Petroleum Corp. 2 Earl Burns, J. W. Meeks Sur. 15, Gardner sand 4,015-40 ft., 560 bbl. of oil, TD 4,040 ft.

TIPPETT. — Upton, May; Paul F. Barnhart 1 V. P. Tippett, 46-38-T5S-T&P, Spraberry, 7,169-7,230 ft., 343 bbl. of oil, TD 7,233 ft. 10 wells at year end.

TODD, WEST—Crockett, August; Amerada Petroleum Corp. 1-K Todd, 15-10-GC&F, San Andres, 1,770-1,820 ft., 82 bbl. oil, TD 7,500 ft.

TYREE—Runnels, March; Humble Oil & Refining So. 1 Roy Tyree, B. E. Hall Sur. 437, Goens lime, 4,206-14 ft., 19 bbl. of oil, TD 5,281 ft.

WALKER - MURRAY - FRY — Runnels, March; T. W. Murray 1 George Cathey, Blk. 93, H&TC, Fry sand, 4,406-16 ft., 125 bbl. of oil, TD 4,419 ft. 2 wells at year end.

WARFIELD-PENNSYLVANIAN—Midland, April; The Texas Co. 2-A Scharbauer NCT-1-C, 19-40-T2S-T&P, Pennsylvanian, 10,300-10,715 ft., 412 bbl. of oil, TD 10,775 ft.

WEDDELL - SPRABERRY — Reagan, May; Blackwood & Nichols 1 Weddell, 19-E-HE-&WT, Lower Spraberry, 7,145-85 ft., 209 bbl. of oil, TD 11,548 ft. 5 wells at year end.

WHEAT-YATES SAND — Loving, February; Donnell Drilling Co. 3 J. J. Victor, 4-2-W&NW, Yates sand, 2,490-2,500 ft., 99 bbl. of oil, TD 2,500 ft. 19 wells at year end.

WILLEKE—Runnels, February; Franklin Love & Co. 1 Joe Willeke, 1-1-Wm. Wilson Sur., Serratt sand, 1,927 ft., 120 bbl. of oil, TD 1,955 ft. 2 wells at year end.

WILSHIRE—Upton, May; Sinclair Oil & Gas Co. 1 McElroy Ranch, 129-D-CCSD&-RGNG, Pennsylvanian 9,365-9,405 ft., 117 bbl. of oil, Ellenburger 12,100-300 ft., 1,681 bbl. of oil, TD 12,438 ft. 9 wells at year end.

WORLD - PENNSYLVANIAN — Crockett, September; Continental and Humble 1-E Powell, 62-BB-EL&RR, Pennsylvanian, 8,088-8,112 ft., 288 bbl. of oil, TD 8,288 ft. 22 wells at year end.

UNNAMED—Andrews, July; Cities Service Oil Co. 1-B Reed, 10-A36-PSL, Pennsylvanian, 9,145-50 ft., 487 bbl. of oil, TD 10,-999 ft.

UNNAMED—Andrews, July; Sinclair Oil & Gas Co. 1 R. A. Cox, 8-A30-PSL, Wichita-Albany, 7,445-7,550 ft., 138 bbl. of oil, TD 7,600 ft.

UNNAMED—Coke, April; Sun Oil Co. 2 H. L. Bloodworth, 462-1-A-H&TC, Strawn lime, 5,664-69 ft., 55 bbl. of oil, TD 6,660 ft.

UNNAMED — Concho, January; C. B. Drilling Co. 1 Walter Pfluger, Sec. 2,088, A. Satos Sur., Canyon, 2,121-24 ft., 102 bbl. of oil, TD 2,141 ft.

UNNAMED—Crane, January; Humble Oil & Refining Co. 1 Hallie Day, 15-X-CCSD&-RGNG, Devonian, 8,606-46 ft., 111 bbl. of oil, TD 8,651 ft.

UNNAMED—Crane, February; Cabot Carbon Co. 1 J. B. Mayberry, 3-31-H&TC, Connell sand, 5,133-37 ft., 17 bbl. of oil, TD 5,335 ft.

UNNAMED—Crane, April; Placid Oil Co. et al 1 E. A. Culberson, 16-6-H&TC, San Andres, 3,110-15 ft., 83 bbl. of oil, TD 3,315 ft.

UNNAMED—Crane, August; Humble Oil & Refining Co. 3 J. M. Cowden, 47-X-CCSD-&RGNG, Fusselman, 7,346-7,433 ft., 65 bbl. of oil, TD 8,984 ft.

UNNAMED — Crockett, March; Humble Oil & Refining Co. 1-D Alma Cox, 4-QR-GC&SF, Ellenburger, 7,300-60 ft., 12 bbl. of cond., TD 8,203 ft.

UNNAMED—Dawson, January; Sunray Oil Corp. 1 Robt. Brown, 3-35-T4N-T&P, Canyon reef, 9,496-9,524 ft., 302 bbl. of oil, TD 9,538 ft.

UNNAMED—Dawson, May; Amerada Petroleum Corp. 1 D. L. Adcock, 106-34-T7N-D&SE, Siluro-Devonian, 10,605-15 ft., 883 bbl. of oil, TD 10,888 ft.

UNNAMED—Dawson, September; El Tee Oil Co. 1 F. Briley, 96-M-EL&RR, Pennsylvanian reef, 8,575-90 ft., 734 bbl. of oil, TD 8,640 ft.

UNNAMED — Dawson, October; Greenbrier Oil Co. 1 M. C. Lindsey, 132-M-EL&-RR, Strawn reef, 10,957-67 ft., 403 bbl. of oil, TD 10,970 ft.

UNNAMED — Dawson, November; C. L. Norsworthy, Jr. and Jay Simmons 1 Wright, 19-1-J. Poitevant Sur., Spraberry, 7,290-7,323 ft., 162 bbl. of oil, TD 7,323 ft.

UNNAMED—Garza, February; Continental Oil Co. 2 Swenson, 43-2-H&GN, Canyon reef, 6,855-95 ft., 232 bbl. of oil, TD 8,150 ft.

UNNAMED — Gaines, August; Magnolia Petroleum Co. 1 J. B. Chilton, Lge. 288, Gray CSL, Pennsylvanian, 11,334-42 and 11,-354-75 ft., 472 bbl. of oil, TD 12,437 ft.

UNNAMED—Glasscock, June; El Capitan Oil Co. 1 Whitehouse, 47-37-T4S-T&P, Spraberry, 6,936-7,028 ft., 322 bbl. of oil, TD 7,028 ft.

UNNAMED—Glasscock, August; Paul F. Barnhart 1-10 J. O. Bigby, 10-36-T5S-T&P, Spraberry, 6,710-6,808 ft., 408 bbl. of oil, TD 6,808 ft.

UNNAMED—Kent, April; Kewanee Oil Co. 1 Oliver, 11-1-H&GN, Canyon reef, 6,376-7,502 ft., 604 bbl. of oil, TD 6,722 ft.

UNNAMED—Martin, July; Union Sulphur & Oil Corp. 1 Arnett & Snyder, 30-36-T1S-T&P, Spraberry, 7,184-7,249 ft., 36 bbl. of oil, TD 7,249 ft.

UNNAMED—Martin, August; Tide Water Associated Oil Co. 1 Dickenson, 44-37-T1N-T&P, Ellenburger, 12,087-105 ft., 235 bbl. of oil, TD 12,136 ft.

UNNAMED — Midland, February; Ralph Lowe, Inc. 1 J. E. Hill, 30-39-T2S-T&P, Wolfcamp, 9-125-9,240 ft., 276 bbl. of oil, TD 13,043 ft.

UNNAMED—Midland, June; Moore Exploration Co. 1 A. R. Bauman, 14-38-T2S-T&P, Pennsylvanian, 11,284-93 ft., 226 bbl. of oil, TD 11,293 ft.

UNNAMED—Midland, October; Blackwood & Nichols 1 Hoffercamp, 19-38-T1S-T&P, Pennsylvanian, 11,140-316 ft., 201 bbl. of oil, TD 11,316 ft.

UNNAMED—Mitchell, October; Richardson & Bass 1 J. F. McCabe, 5-12-H&TC, Cisco sand, 6,045-6,177 ft., 78 bbl. of oil, TD 7,330 ft.

UNNAMED—Pecos, January; Callery & Hurt, Inc. 1-A H. J. Eaton, 27-3-H&TC, Montoya, 5,324-5,470 ft., 154 bbl. of cond., TD 8,061 ft.

UNNAMED—Pecos, January; C. H. Murphy Corp. E. Ford, 3-3-H&TC, Simpson, 5,175-83 ft., 336 bbl. of oil, TD 6,076 ft.

UNNAMED — Pecos, March; Callery & Hurt, Inc. 1-A H. J. Eaton, 27-3-H&TC, Silurian, 5,328-5,470 ft., 154 bbl. of cond., TD 8,061 ft.

UNNAMED—Pecos, July; Helmerich & Payne, Inc. 1-F Lowery & Wilson, 19-2-TCRR, San Andres, 2,000-12 ft., 59 bbl. of oil, TD 2,019 ft.

UNNAMED—Reagan, May; Texas Crude Oil Co. 1-40 Proctor, 40-37-T5S-T&P, Spraberry, 6,920-7,128 ft., 71 bbl. of oil, TD 7,128 ft.

UNNAMED— Reagan, July; Sunray Oil Corp. 1-8 Sherrod "A," 8-C-L&SV, Spraberry, 6,934-7,013 ft., 141 bbl. of oil, TD 7,013 ft.

UNNAMED—Reagan, August; Lloyd H. Smith, Inc. 1 D. E. Hughes, 23-F-C&M, Spraberry, 5,799-5,870 ft., 40 bbl. of oil, TD 5,870 ft.

UNNAMED—Reagan, October; Sohio Petroleum Co. 1 Leonard Proctor, 32-36-T5S-T&P, Lower Spraberry, 7,565-96 ft., 645 bbl. of oil, TD 7,656 ft.

UNNAMED—Reagan, November; Paul F. Barnhart 1-13 Patterson, 13-C-L&SV, Lower Spraberry, 7,524-77 ft., 360 bbl. of oil, TD 7,577 ft.

UNNAMED — Runnels, February; Dallas Consolidated Petroleum Corp. 1 W. H. Pape, Blk. 5, J. H. Sam Miguel Sur. 72, Strawn, 3,906-12 ft., 132 bbl. of oil, TD 3,971 ft.

UNNAMED — Runnels, February; J. B. Ashmund 1 Mrs. Nora McCaughan, Blk. 14, T. M. Fowler Sur. 440, Jennings sand, 4,486-89 ft., 53 bbl. of oil, TD 4,529 ft.

UNNAMED—Runnels, September; Vincent & Welch 1 E. E. Brown, Austin & Williams Sur., Strawn, 3,751-61 ft., 52 bbl. of oil, TD 4,257 ft.

UNNAMED—Runnels, October; Miami Operating Co. 1 Joe Ashton, Austin & Williams Sur., Sec. 262, Strawn, 3,,787-94 ft., 114 bbl. of oil, TD 3,850 ft.

UNNAMED — Runnels, November; Gulf Plains Corp. 1 N. J. Whitley, Sec. 139, I. P. Wallace Sur., Strawn sand, 3,484-96 ft., 76 bbl. of oil, TD 3,499 ft.

UNNAMED—Sterling, December; Honolulu Oil Corp. 1-A Sugg, 55-2-T&P, Spraberry, 5,026-51 ft., 344 bbl. of oil, TD 5,151 ft.

UNNAMED—Upton, June; B. L. McFarland 1-28 Leonard Proctor, 28-37-T5S-T&P, Spraberry, 6,940-7,040 ft., 126 bbl. of oil, TD 7,040 ft.

UNNAMED — Upton, June; Bayer-Hunefelt Drilling Co. 1 O'Neal, 184-E-CCSD&-RGNG, San Andres, 3,44-88 ft., 51 bbl. of oil, TD 3,489 ft.

UNNAMED—Upton, June; Gulf Oil Corp. 1-H McElroy, 169-E-CCSD&RGNG, Pennsylvanian, 9,145-9,450 ft., 817 bbl. oil, TD 12,-385 ft.

UNNAMED—Upton, September; Humble Oil & Refining Co. 1-B Shackelford, 17-38-T5S-T&P, Wolfcamp, 8,139-63 ft., 63 bbl. of oil, TD 8,163 ft.

UNNAMED — Yoakum, August; York & Harper, Inc. 1 J. E. Wright, 13-D-J. H. Gibson, 5,940-62 ft., 354 bbl. of oil, TD 6,074 ft.

NEW PAYS

BEDFORD-FUSSELMAN—Andrews, April; Shell Oil Co. 12 Ratliff & Bedford, 4-73-PSL, Fusselman, 9,702-9,895 ft., 626 bbl. of oil, TD 9,895 ft.

BENEDUM-UPPER SPRABERRY—Upton, May; Blackwood & Nichols 3 Humble-Barnett, 4-Y-CCSD&RGNG, upper Spraberry, 6,590-6,643 ft., 335 bbl. of oil, TD 6,643 ft

BURT - GARDNER — Runnels, January; E. K. & E. M. Burt 7-A Mrs. Malinda Jameson, ETRR Sur. 118, Gardner sand, 3,430-36 ft., 268 bbl. of oil, TD 3,436 ft.

COGDELL—Kent, November; Chapman & McFarlin 33-A D. M. Cogdell, 773-97-H&TC, San Andres, 1,475-1,570 ft., 65 bbl. of oil, TD 7,682 ft.

COGDELL—Scurry, November; The Texas Co. 178 Fuller, 650-97-H&TC, Strawn sand, 7,211-15 ft., 57 bbl. of oil, TD 7,918 ft.

COGDELL - FULLER — Kent, January; Chapman & McFarlin Producing Co. 25

BS&B 70 G INDIRECT HEATERS

Make Sense • Save Dollars

on This East Texas 12 Inch Gathering Line...

BS&B 70G indirect heater on Carthage, Tex. system. (Right) a 10 year-old BS&B indirect heater still in use for auxiliary service.

Putting the heat on the 40 Million CF of gas flowing daily through the 12 in. line of an extensive gathering system near Carthage, Texas, has been greatly simplified by the use of four BS&B Series 70 Giant heaters over a 12 mile stretch. With a 4 million BTU hourly input and a thermal efficiency better than 70%, these BS&B Giant indirect Heaters not only reduced the initial heater purchase and installation cost to a minimum but are saving money on fuel consumption and maintenance every day. They're constant proof that economy and efficiency are partners in BS&B oil field equipment.

7 ADVANTAGES OF BS&B "70" HEATERS

SAVES FUEL GAS—at rated capacity, the overall thermal efficiency is 70% or more—highest of any heater unit.

SAVES UNIT COST—"70" Series indirect heaters are fabricated in sizes ranging from 250,000 to 4,000,000 BTU input per hour—a heater for every gas and oil heating job.

SAVES MAINTENANCE COSTS—easier to service because firebox and flow coil can be pulled separately—from opposite ends.

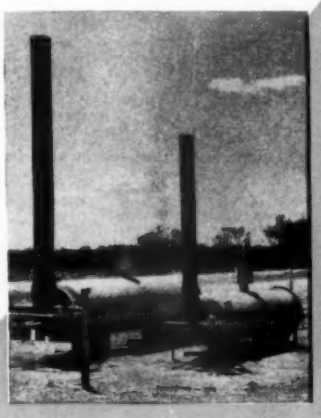
SAFER WATER LEVELS—the exclusive BS&B Water Saver condenses hot water vapor, returns it to main water bath.

GREATER FLOW TUBE SURFACE—it's the square feet of transfer surface that counts—the BS&B flow coil offers more surface.

GREATER SAFETY—the gas and oil are completely sealed from firebox—surrounded by water; the even heat of water bath reduces scaling, prevents burnouts.

BS&B ENGINEERING SERVICE—always available, the highly skilled, prompt service of your nearby BS&B sales engineer—the engineering facilities of Black, Sivalls and Bryson's Oil and Gas Division at Oklahoma City—and the 35 efficiently staffed and equipped sales and engineering branches maintained by BS&B in the oil country.

70S (standard) and 70B (bantam) BS&B heaters at a South Texas wellhead, utilized with two-stage separation. The BS&B 70 series heater reputation for reliability has made it the most popular for field installations.



EFFICIENCY BS&B RELIABILITY

BLACK, SIVALLS & BRYSON, INC.

OIL & GAS EQUIPMENT DIVISION, DEPT. 1A1

2131 WESTWOOD BLVD. • OKLAHOMA CITY, OKLA.

D. M. Cogdell, 716-97, H&TC, Fuller sand, 4,986-98, 5,004-20 ft., 1,033 bbl. of oil, TD 6,878 ft.

JORDAN-ELLENBURGER—Ector, February; Sinclair Oil & Gas Co. 5 W. E. Connell, 10-B16-PSL, Ellenburger, 8,780-8,910 ft., 234 bbl. of oil, TD 8,916 ft.

JORDAN - FUSSELLMAN — Ector, April; Shell Oil Co. 3-C Connell, 13-B16-PSL, Fusselman, 7,420-61 ft., 1,092 bbl. of oil, TD 7,461 ft.

MARTIN-WOLFCAMP — Andrews, July; Atlantic Refining Co. 1-B University, 23-11-University Lands, Wolfcamp, 7,956-70 ft., 232 bbl. of oil, TD 9,296 ft.

PEGASUS-PENNSYLVANIAN — Midland, April; Phillips Petroleum Co. JJ-1 TXL, 25-41-T4S-T&P, Pennsylvanian, 10,470-540 ft., 504 bbl. of oil, TD 13,236 ft.

SOUTH WARD—Ward, November; Cities Service Oil Co. 1 Grimes, 14-34-H&TC, Seven Rivers, 2,950-54 ft., 70 bbl. of oil, TD 3,017 ft.

WINTERS - CADDO—Runnels, March; Bouchard & Callihan 1 J. S. Brown, Blk. 64, H&TC, Caddo, 4,498-4,504 ft., 250 bbl. of oil, TD 4,505 ft.

NORTH CENTRAL TEXAS

Districts 7-B and 9

NEW POOLS

AMY SEARS—Jones, July; Humble Oil & Refining Co. 1 Amy Sears, 28-2-SPRR, King sand, 3,012-24 ft., 234 bbl. of oil, TD 3,024 ft. 6 wells at year end.

ARCHER COUNTY REGULAR — Archer, January; Chas. E. Morrison 8 H. O. Prideaux, A. Rohus Sur., A-1,126, Strawn, 4,184-95 ft., 52 bbl. of oil, TD 4,230 ft.

ARCHER COUNTY REGULAR — Archer, March; Wayne Freeman, Jr. 1 J. M. Bloodworth, M. Cartwright Sur., A-60, Mississippian, 5,118-36 ft., 186 bbl. of oil, TD 5,144 ft.

ARCHER COUNTY REGULAR — Archer, March; Harry F. Snebold 1 W. T. Wells, R. Neil Sur. 2, Bend lime, 4,632-50 ft., 80 bbl. of oil, TD 4,650 ft.

ARCHER COUNTY REGULAR — Archer, March; J. B. Palmer 1 Charles Meurer, 99-4-Clark & Plumb, Strawn, 3,535-41 ft., 5 bbl. of oil, TD 3,541 ft.

ARCHER COUNTY REGULAR — Archer, March; Hale & West 1 D. M. Powell, SPRR Sur., A-406, Strawn, 3,780-94 ft., 175 bbl. of oil, TD 3,794 ft.

ARCHER COUNTY REGULAR — Archer, March; W. G. Rogers 1 L. Kinder, Clark & Plumb Sur., Blk. 5, Strawn, 3,724-30 ft., 72 bbl. of oil, TD 3,803 ft.

ARCHER COUNTY REGULAR — Archer, March; San Juan Oil Co. 1 S. L. Scott, T. McCoy Sur., Caddo, 4,780-94 ft., 82 bbl. of oil, TD 5,527 ft.

ARCHER COUNTY REGULAR — Archer, March; Reno Oil Co. 1 L. F. Wilson, AT-NCL Sur., Geraldine Townsite Subd., Strawn, 3,774-96 ft., 69 bbl. of oil, TD 3,796 ft.

ARCHER COUNTY REGULAR — Archer, September; Megargel Drilling Co. 1 Bishop, L. M. Meades Pasture Subd., Cisco, 1,413-16 ft., 75 bbl. of oil, TD 1,416 ft.

ARCHER COUNTY REGULAR — Archer, October; Chas. E. Morrison 1-C Prideaux, John Dorsey Sur., Canyon sand, 2,786-92 ft., 70 bbl. of oil, TD 2,792 ft.

ASPERMONT LAKE — Stonewall, May; DeSoto Oil & Gas Co. 1 V. B. Bullard, 129-D-H&TC, Canyon sand, 4,888-4,920 ft., 419 bbl. of oil, TD 5,550 ft.

ASPERMONT LAKE — Stonewall, October; Continental Oil Co. 1 Flossie Scoggins "A," 124-D-H&TC, Canyon reef, 4,910-18 ft., 441 bbl. of oil, TD 4,925 ft.

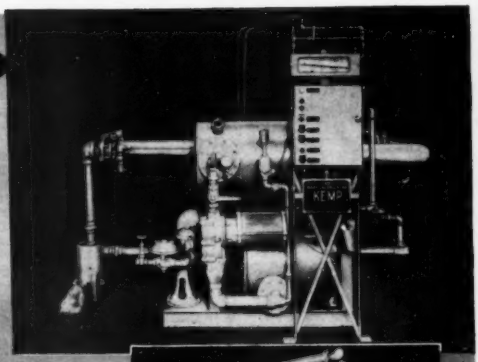
BAKER PROPERTIES CAMBRON — Wilbarger, April; Baker Properties 1-B J. M. Cambron, 8-5-H&TC, Dyson sand, 1,900-20 ft., 51 bbl. of oil, TD 2,450 ft.

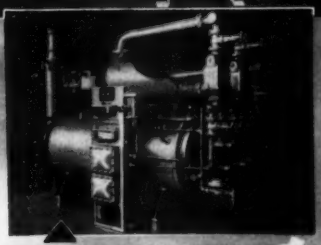
BLACK—Taylor, October; Humble Oil & Refining Co. 4 Henry Sayles, 268-64-H&TC, Canyon lime, 3,550-59 ft., 111 bbl. of oil, TD 4,804 ft.

BLAIR—Taylor, July; Drilling & Exploration Co., Inc., 2-A T. O. Lackey, 64-19-T&P, Tannehill sand, 2,739-47 ft., 304 bbl. of oil, TD 2,907 ft. 16 wells at year end.

BLAIR-FLIPPEN—Taylor, January; Drilling & Exploration Co. 2 John Meeks, 63-19-

Model 1 MHE offers all the features of larger equipment . . . delivers 1000 cfh . . . is fully automatic.





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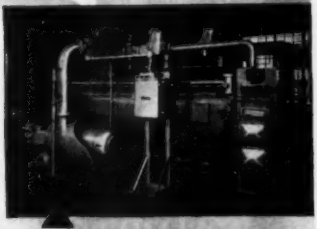

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ADSORPTIVE DRYERS • METAL MELTING UNITS • SINGEING EQUIPMENT • SPECIAL EQUIPMENT

T&P, Flippen, 2,806-14 ft., 62 bbl. of oil, TD 2,887 ft.

CLAY COUNTY REGULAR—Clay, May; L. T. Burns 1-A. F. Bunting, J. N. Graves Subd., Orange CSL, Mississippian, 5,978-6,031 ft., 125 bbl. of oil, TD 6,031 ft.

CLAY COUNTY REGULAR—Clay, June; L. T. Burns 1 S. F. Phillips, Sec. 37, Graves Subd., Orange CSL, Ellenburger, 6,320-32 ft., 180 bbl. of oil, TD 6,464 ft.

CLAY COUNTY REGULAR—Clay, October; B. L. Wooley 1 E. F. Galloway, Blk. 9, Hopkins CSL, Mississippian, 5,986-6,026 ft., 52 bbl. of oil, TD 6,136 ft.

COOKE COUNTY REGULAR—Cooke, January; Virgil Taylor 1 S. D. Meador, G. Ivey Sur., A-517, Strawn, 1,504-1,610 ft., 73 bbl. of oil, TD 1,610 ft.

COOKE COUNTY REGULAR—Cooke, January; Wilson Bros. Oil Co. 1 W. F. Solomon-West Ranch, 5-A976-SPRR, Caddo, 2,382-88 ft., 84 bbl. of oil, TD 2,388 ft.

COOKE COUNTY REGULAR—Cooke, February; F & M Drilling Co. 1 Helene Kleiss, John Trussell Sur., A-1,225, Ellenburger (?), 2,046-51 ft., 105 bbl. of oil, TD 2,051 ft.

COOKE COUNTY REGULAR—Cooke, May; J. C. Riley, Jr. 1 Earl Shipley, Blk. 475, T. J. Harris Sur., Ellenburger, 1,495-1,502 ft., 73 bbl. of oil, TD 1,502 ft.

COOKE COUNTY REGULAR—Cooke, July; W. A. Loftin 1-B J. G. Cannon, John F. Johns Sur., Strawn, 1,307-18 ft., 57 bbl. of oil, TD 1,318 ft.

COOKE COUNTY REGULAR—Cooke, September; Sinclair Oil & Gas Co. 1 S. F. Murrell, Alexander Horton Sur. 182, Strawn, 3,692-3,706 ft., 383 bbl. of oil, TD 6,261 ft.

COOKE COUNTY REGULAR—Cooke, September; Kimbell-Sims 1 T. A. Crawford, Blk. 18, Fannin CSL, Canyon, 3,562-70 ft., 95 bbl. of oil, TD 3,570 ft.

COTTONDALE—Wise, September; Blackwell Oil & Gas Co. 1 A. H. Pearson, Blk. 43, MEP&P Sur., Caddo, 3,867-94 ft., 21 bbl. of oil, TD 3,966 ft.

COTTONDALE, SOUTH—Wise, October; Signal Oil & Gas Co. 1 J. B. Burns, B. F. Banks Sur., Ellenburger, 6,912-7,000 ft., 585 bbl. of oil, TD 7,503 ft.

COX—Nolan, June; Skelly Oil Co. 1 Evelyn Cox, 85-23-T&P, Ellenburger, 6,975-7,024 ft., 88 bbl. of oil, TD 7,024 ft.

DALY-CADDO—Wise, October; Kingwood Oil Co. 2-C Jack E. Daly, Darrell Mangum Sur., A-560, Caddo, 4,027-64 ft., 70 bbl. of oil, TD 4,130 ft.

DARDEN-GUNSITE—Archer, March; R. W. Darden 2 Estill-Key, L. M. Meade Pasture Subd., Probert Sur., Gunsite, 1,440-42 ft., 54 bbl. of oil, TD 1,442 ft.

EASTLAND COUNTY REGULAR—Eastland, May; Tal Vez Oil Co. 1 Joe Cook, 34-20-T&P, Flippen sand, 1,929-34 ft., 81 bbl. of oil, TD 1,934 ft.

EASTLAND COUNTY REGULAR—Eastland, October; Haynes B. Ownby Drilling Co. 1 Mrs. Effie Brown, 110-3-H&TC, Marble Falls, 3,730-50 ft., 78 bbl. of oil, TD 3,974 ft.

ELM CREEK—Taylor, July; Humble Oil & Refining Co. 1 J. R. Black, 269-64-H&TC, Strawn lime, 4,902-08 ft., 147 bbl. of oil, TD 5,477 ft.

ETTER—Montague, August; Standard Oil Co. of Texas 1 J. S. Etter, 12-A522-MEP&P, Bend conglomerate, 5,772-5,821 ft., 1,518 bbl. of oil, TD 5,821 ft. 2 wells at year end.

FLAT TOP—Stonewall, June; Cities Service Oil Co. 1-140 Flat Top, Sec. 140, BBB&C Sur., Swastika sand, 3,382-3,405 ft., 330 bbl. of oil, TD 3,405 ft. 4 wells at year end.

FLAT TOP—Stonewall, March; Cities Service Oil Co. 1 Flat Top 161, Sec. 161, BBB&C Sur., Strawn, 5,258-75 ft., 35 bbl. of oil, TD 6,275 ft.

FRANKIRK-ELLENBURGER—Stonewall, January; F. Kirk Johnson 1 Leon Anderson, 18-U-T&P, Ellenburger, 5,928-41 ft., 198 bbl. of oil, TD 5,941 ft. 14 wells at year end.

GILCHRIST-SWENSON—Stephens, March; Gilchrist Drilling Co. 1-A Swenson Ranch, 37-5-T&P, Strawn sand, 1,924-29 ft., 32 bbl. of oil, TD 2,258 ft.

GLEN COVE—Coleman, August; Luling Oil & Gas Co. 1 I. G. Whittington, Sec. 11, T&NO, Fry sand, 3,345-68 ft., 423 bbl. of oil, TD 3,370 ft. 14 wells at year end.

GRAHAM—Jack, April; Larson & Thomas 1 M. L. Smith, J. Bailey Sur., A-141, Strawn, 3,068-82 ft., 124 bbl. of oil, TD 3,157 ft. 2 wells at year end.

HENRIETTA, EAST—Clay, January; Stephens Petroleum Co. 1 Bryant Edwards, 7-A669-T&NO, Simpson, 6,227-51 ft., 307 bbl. of oil, TD 6,495 ft.

HASKELL COUNTY REGULAR—Haskell, September; E. K. & E. M. Burt 2 Swenson, 13-1-BBB&C, Swastika sand, 2,499-2,507 ft., 84 bbl. of oil, TD 2,507 ft.

HASKELL COUNTY REGULAR—Haskell, October; Deep Rock Oil Corp. 1 Joe Jenkins, 289-45-H&TC, Strawn sand, 4,828-4,900 ft., 118 bbl. of oil, TD 4,936 ft.

HINES—Stonewall, May; Oxford Drilling Co. 1 W. H. Bennett, 171-1-BBB&C, Strawn, 5,324-38 ft., 58 bbl. of oil, TD 5,412 ft.

HOLLIDAY, EAST—Archer, January; Fain & McGaha 1-B Annie B. Wallace, Blk. 2, Denton CSL, Strawn, 4,141-55 ft., 60 bbl. of oil, TD 4,155 ft. 4 wells at year end.

HUMPHREY-DAVIS (STRAWN)—Knox, May; T. D. Humphrey 1 Mrs. Mattie Davis, E. Boren Sur., A-27, Strawn, 5,120-34 ft., 87 bbl. of oil, TD 6,020 ft.

HUNDLEY-STRAWN—Montague, March; Tom B. Medders 4 W. C. Williams, Henry Hadden Sur., A-346, Strawn, 5,759-69 ft., 383 bbl. of oil, TD 5,769 ft.

HUNSAKER—Fisher, May; Sinclair Oil & Gas Co. 1 Belle Hunsaker, 282-2-H&TC, Strawn, 5,710-20 ft., 240 bbl. of oil, TD 6,709 ft.

HYLTON-STRAWN—Nolan, October; Seaboard Oil Co. of Delaware 1 Billie Hanks, 28-Z-T&P, Strawn, 5,545-60 ft., 383 bbl. of oil, TD 6,363 ft.

IBEX-STRAWN—Shackelford, June; The Ibex Co. 1 Lynch-Thomson, BAL Sur., Sec. 25, Strawn, 3,019-27 ft., 112 bbl. of oil, TD 3,027 ft. 4 wells at year end.

JACK COUNTY REGULAR—Jack, January; Russell Maguire 1 Cantrell, SPRR Sur.,

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A-1,629, Bend conglomerate, 4,694-4,723 ft., 97 bbl. of oil, TD 4,723 ft.

JACK COUNTY REGULAR—Jack, January; Texas-Canadian Oil Corp. 1-A M. M. Garrett, BBB&C Sur., A-100, Strawn, 3,028-47 ft., 80 bbl. of oil, TD 5,737 ft.

JACK COUNTY REGULAR—Jack, April; J. C. Hurley 1 L. W. Carney, J. D. Rogers Sur., A-501, Bend conglomerate, 4,896-4,905 ft., 95 bbl. of oil, TD 4,905 ft.

JACK COUNTY REGULAR—Jack, April; Star Oil Co. 1 Anna Kinder, SPRR Sur., A-1,411, Caddo, 4,502-08 ft., 202 bbl. of oil, TD 4,526 ft.

JACK COUNTY REGULAR—Jack, April; J. C. Jennings et al 1 C. E. Clayton, TE&L Sur. 3,340, A-829, Caddo, 4,914-42 ft., 100 bbl. of oil, TD 4,970 ft.

JACK COUNTY REGULAR—Jack, June; Fain & McGaha 1 W. E. Maxey, SPRR Sur. 2, A-2,018, Strawn, 3,620-36 ft., 221 bbl. of oil, TD 3,636 ft.

JACK COUNTY REGULAR—Jack, July; Franklin Love & Co. 1 E. M. Williams, 3-A87-BS&F, Ellenburger, 4,848-62 ft., 177 bbl. of oil, TD 4,862 ft.

JACK COUNTY REGULAR—Jack, September; Bridwell Oil Co. 1 H. O. Prideaux, Sec. 1, SPRR Sur., Strawn, 3,611-34 ft., 77 bbl. of oil, TD 3,634 ft.

JACK COUNTY REGULAR—Jack, September; Neeld & Hood Drilling Co. 2 H. O. Prideaux, SPRR Sur., A-577, Strawn, 3,568-3,610 ft., 105 bbl. of oil, TD 3,610 ft.

JACK COUNTY REGULAR—Jack, October; Bolin Oil Co. 2 Loving Estate, Blk. 2,776, TE&L Sur., Cisco, 2,133-40 ft., 54 bbl. of oil, TD 2,147 ft.

JACK COUNTY REGULAR—Jack, October; Cox Drilling Co. 1 Nora Kee, J. J. Waggoner Sur., Strawn, 2,255-57 ft., 55 bbl. of oil, TD 4,860 ft.

JACK COUNTY REGULAR—Jack, October; F. Kirk Johnson 1 Bettie Allen, Blk. 2, Henderson CSL, Bend conglomerate, 4,563-4,606 ft., 176 bbl. of oil, TD 4,606 ft.

JONES COUNTY REGULAR — Jones, March; Woodley Petroleum Co. 1-A H. F. Lewis, Catherine Allen Sur. 10, Bluff Creek, 1,870-75 ft., 116 bbl. of oil, TD 1,875 ft.

JONES COUNTY REGULAR — Jones, April; Woodley Petroleum Co. 1 H. L. Bartlett, C. Allen Sur. 10, Bluff Creek, 1,871-76 ft., 97 bbl. of oil, TD 1,887 ft.

JONES COUNTY REGULAR — Jones, June; V. C. Perini, Jr., 1 S. R. Brooks, 28-2SPRR, Swastika sand, 3,123-30 ft., 264 bbl. of oil, TD 3,130 ft.

JONES COUNTY REGULAR — Jones, August; W. A. Moncrief et al 1 W. E. Winkles, J. M. Smith Sur. 3, Cisco sand, 1,690-97 ft., 80 bbl. of oil, TD 1,697 ft.

JONES COUNTY REGULAR — Jones, September; S. C. Herring Drilling Co. 1 D. A. Bandeen, 120-1-BBB&C, Cisco sand, 2,418-28 ft., 88 bbl. of oil, TD 2,428 ft.

KING-CADDO — Throckmorton, April; Drilling & Exploration Co. 1-C Richardson Trust, Sec. 269, BBB&C Sur., Caddo, 4,554-70 ft., 42 bbl. of oil, TD 5,124 ft. 2 wells at year end.

L. C. (STRAWN)—Archer, April; Tom B. Medders 7 Williams & Nelson, E. A. McDonald Sur., A-1,165, Strawn, 3,856-71 ft., 186 bbl. of oil, TD 3,875 ft.

LONE PRAIRIE—Montague, July; Wabash Oil Co. 9-H Mitchell, J. C. Mattison Sur., Ellenburger, 6,088-96 ft., 195 bbl. of oil, TD 6,670 ft.

LUEDERS, WEST-HOPE—Jones, September; Roark-Hooker & Roark 1 J. C. Williams, BBB&C Sur. 204, Hope, 1,881-98 ft., 1,139 bbl. of oil, TD 2,311 ft. 5 wells at year end.

LUKE (N-SAND) — Archer, February; Shell Oil Co. 3 Luke, 117-2-ATNCL, Strawn, 3,848-58 ft., 85 bbl. of oil, TD 4,925 ft.

MARTIN—Young, September; Anzac Oil Corp. 6 A. P. Martin, G. Cothran Sur., A-1,401, Marble Falls, 4,023-29 ft., 135 bbl. of oil, Mississippian, 4,390-4,435 ft., 106 bbl. of oil, TD 4,435 ft.

MEAD—Jones, June; Geochemical Surveys 1 T. D. Compton, 22-17-HP, Canyon sand, 4,478-84, 4,494-4,505 ft., 200 bbl. of oil, TD 4,949 ft.

MESQUITE — Jones, January; Woodley Petroleum Co. 1 Ida L. Weaver, 6-17-T&P, Strawn, 4,560-73 ft., 77 bbl. of oil, TD 4,573 ft.

MONTAGUE COUNTY REGULAR—Montague, April; General American Oil Co. 1 P. E. Boedecker, Sec. 2,853, TE&L Sur., Viola, 6,791-6,813 ft., 96 bbl. of oil, TD 6,818 ft.

MONTAGUE COUNTY REGULAR—Montague, July; C. S. Atchison 1 John Kirby, 156-A687-J. Smith Sur., Bend, 5,853-5,942 ft., 98 bbl. of oil, TD 6,178 ft.

MONTAGUE COUNTY REGULAR—Montague; October; O. E. Hall 1 J. P. Ligon, D. D. Baker Sur., A-74, Strawn, 3,106-14 ft., 139 bbl. of oil, TD 3,114 ft.

NOODLE-STRAWN—Jones, July; French M. Robertson 1 Forest E. Black, Sec. 41, Lge. 149, De Witt CSL, Strawn, 4,613-18 ft., 153 bbl. of oil, TD 5,232 ft.

OGDEN-MABEE, NORTH — Coleman, March; United North & South Development Co. 1 O. O. McWilliams, G. W. Handreth Sur., Jennings sand, 3,549-57 ft., 122 bbl. of oil, TD 3,600 ft. 10 wells at year end.

OLNEY-MISSISSIPPIAN—Young, March; Warren Oil Corp. 1 O. D. Swanzy, 240-A487-TE&L, Mississippian, 4,500-18 ft., 154 bbl. of oil, TD 4,950 ft.

OLD GLORY, EAST—Stonewall, February; Cities Service Oil Co. 1 Baitz, Sec. 27, BBB&C Sur., Bend conglomerate, 6,005-29 ft., 24 bbl. of oil, TD 6,130 ft.

PALO PINTO REGULAR—Palo Pinto, June; Palo Pinto Oil & Gas Corp. 2 F. J. Berger, 54-2-T&P, Strawn sand, 3,885-90 ft., 400 bbl. of oil, TD 3,893 ft. 24 wells at year end.

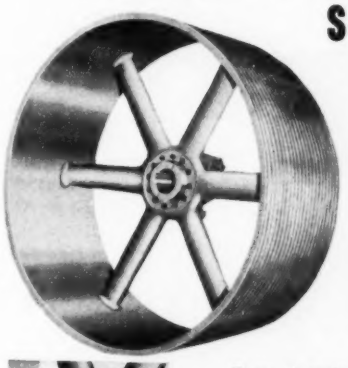
PARDUE, WEST—Fisher, March; General Crude Oil Co. 1 David Ulmer, 102-1-H&TC, Strawn reef, 5,125-40 ft., 108 bbl. of oil, TD 5,140 ft.

PEARY-CADDO—Jack, June; Larson & Thomas 1 W. J. Eatherly, W. B. Stramer Sur., A-1,002, Caddo, 4,950-66 ft., 166 bbl. of oil, TD 4,966 ft.

PRIDEAUX-BEND—Archer, July; **Chas.** E. Morrison 1 H. O. Prideaux, John Dorsey Sur., A-122, Bend, 4,157-4,252 ft., 69 bbl. of oil, TD 4,252 ft.

RALLEN—Fisher, May; Lion Oil Co. 1

FORT WORTH TRANSCO Split Hub
BoltRim Sheaves
are designed and stocked for
SLUSH PUMP SERVICE



Grips the Shaft
The hub is completely split and machined so that it grips the shaft. It will also fit an undersized shaft.

The Hub is Offset
Hub mounts flush with edge of sheave next to pump, reducing overhang load.

Easy to Mount
Hub goes on shaft first. Clamps in proper position and rim is pulled into place by cap screws.

True Running
Flange on hub pulls up tight against face of rim assuring true running sheave without wobble. The problem of uneven tightening of bolts found in other split hub sheaves is thus eliminated.

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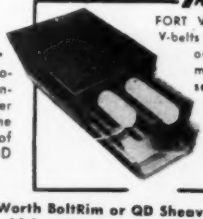

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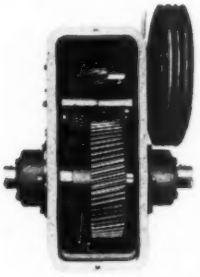
If you are among those oil producers who feel all pumping units are alike, we invite you to make your own comparison. It will show that Alten units:

- ☆ Give longer strokes
- ☆ Have higher gear reducer ratings
- ☆ Are built with better gears



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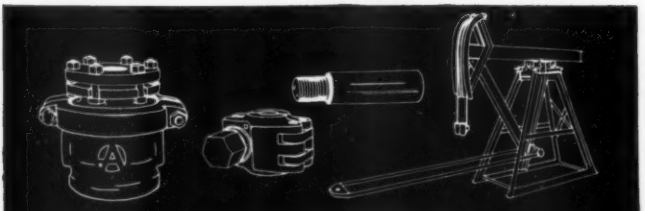
EXTREMELY ACCURATE GEAR TEETH
Continuous direction of hob results in cutting accuracy beyond that obtainable from the shaper process which produces herringbone gears.

REDUCED SHOCK LOAD
Impact or backlash loads are 10 to 20% lower than those on herringbone gears because Helix angles are 50% lower.

MAINTAIN PERFECT TOOTH PROFILE
Because Helical Gears have no unflexing centers, stress is evenly distributed over entire face of gear teeth. Tooth profiles are permanently retained.

FLAME HARDENED TEETH
Gears are precision cut from finest alloy steel and shaved for perfect profile then flame hardened for highest surface hardness obtainable.



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LANCASTER, OHIO

R. R. Rallen, 16-1-HT&B, Flippen, 3,522-44 ft., 140 bbl. of oil, TD 3,581 ft.

RATTLESNAKE MOUNTAIN — Shackelford, May; M. J. Mitchell 1 Arthur Adams, Sec. 15, LAL Sur., Marble Falls, 3,966-71 ft., 156 bbl. of oil, TD 4,272 ft.

RENO-JEAN—Young, April; Reno Oil Co. 1 Warren, Blk. 1,467, TE&L, Mississippian, 5,047-60 ft., 346 bbl. of oil, TD 5,060 ft.

ROGERS & ROGERS—Montague, January; Ralph Myers Contracting Corp. 1 J. S. Woods, Sec. 16, A-844, W. J. Wells Sur., Strawn 4,490-4,500 ft., 82 bbl. of oil, TD 4,500 ft.

SALT PRONG—Shackelford, May; Humble Oil & Refining Co. 1 Roark, Hooker & Roark, 52-12-T&P, Cook sand, 1,571-73 ft., 47.5 bbl. of oil, TD 1,581 ft. 4 wells at year end.

SAXON-GUION—Taylor, June; Saxon Exploration Co. 1 G. S. Billingsly, Blk. 444, Abner Woolsey Sur., Strawn, 3,815-19, 4,255-59 ft., 800 bbl. of oil, TD 4,615 ft. 4 wells at year end.

SPRINGTOWN-CADDO — Wise, March; Kingwood Oil Co. 1 J. H. Peel, A. Hargus Sur., A-447, Caddo, 3,810-40 ft., 174 bbl. of oil, TD 3,938 ft. 5 wells at year end.

STARR-CADDO—Stephens, June; Lone Star Producing Co. 1-A Allar Co., B. B. Stancell Sur., Caddo, 4,320-28 ft., 287 bbl. of oil, TD 4,861 ft.

SHACKELFORD COUNTY REGULAR — Shackelford, April; M. Z. Dibble 1 G. R. Davis, 9-3-T&P, Cisco, 1,601-03 ft., 72 bbl. of oil, TD 1,621 ft.

SHACKELFORD COUNTY REGULAR — Shackelford, June; Taxman Oil Co. 1 Leech Heirs, Sec. 22, LAL Sur., Bend conglomerate, 4,185-91 ft., 80 bbl. of oil, TD 4,401 ft.

STROZIER-CAPPS—Coleman July; Ed Watts 1 Era Strozier, A. Gobel Sur., Sec. 271, Capps limestone, 1,894-1,910 ft., 125 bbl. of oil, TD 1,917 ft.

STEPHENS COUNTY REGULAR—Stephens, September; S. Caprito 1 Compton-Hazelwood, 8-7-T&P, Ellenburger, 4,173-4,211, 122 bbl. of oil, TD 4,211 ft.

STEPHENS COUNTY REGULAR—Stephens, November; Warren Oil Corp. 1 A. P. Fambrough, 15-6-T&P, Marble Falls, 3,668-85 ft., 61 bbl. of oil, TD 4,272 ft.

SWENSON "154"—Throckmorton, January; Cities Service and Sinclair 1-154 Swenson Ranch, Sec. 154, BBB&C Sur., Caddo, 4,973-83 ft., 73 bbl. of oil, TD 5,000 ft.

SWENSON "170"—Throckmorton, January; Cities Service Oil Co. 2 Swenson 170, Sec. 170, BBB&C Sur., Caddo, 4,768-75, 4,780-90 ft., 86 bbl. of oil, TD 5,160 ft.

SWENSON "210"—Throckmorton, March; Cities Service Oil Co. 1 Swenson 210, Sec. 210, BBB&C Sur., Caddo, 4,774-84 ft., 67 bbl. of oil, TD 5,511 ft.

TALLY-STRAWN—Clay, September; L. T. Burns 1 N. H. Starnes, Blk. 46, Belcher Subd., Strawn, 4,350-73 ft., 244 bbl. of oil, TD 4,373 ft.

TAYLOR COUNTY REGULAR—Taylor, October; Reno Oil Co. 1 Allene Johnson, Blk. 446, G. W. Denton Sur., Bend, 4,219-66 ft., 1,440 bbl. of oil, TD 4,266 ft.

THREADGILL - STRAWN—Montague, April; Stephens Petroleum Co. 1 Threadgill, Sec. 1, Jack CSL, Strawn, 4,958-64 ft., 126 bbl. of oil, TD 6,370 ft.

THROCKMORTON COUNTY REGULAR—Throckmorton, June; Warren Oil Corp. 1 Annie Johnston, Blk. 1,643, TE&L Sur., Caddo, 3,694-3,704 ft., 390 bbl. of oil, Mississippian 4,510-22 ft., 686 bbl. of oil, TD 4,522 ft.

TOUCHSTONE—Jones, June; Sohio Petroleum Co. 1 Iva Touchstone, 9-17-T&P, Strawn sand, 4,444-67 ft., 223 bbl. of oil, TD 4,668 ft.

TRUBY, EAST—Jones, July; W. E. Butler 1 G. B. Triplett, J. J. Hughes Sur., Cisco sand, 2,255-59 ft., 168 bbl. of oil, TD 2,500 ft.

WARD-McCULLOUGH—Jack, June; Ward & McCullough 1 W. D. Moore, SPRR Sur., A-1,730, Strawn, 3,614-44 ft., 420 bbl. of oil, TD 3,644 ft.

WEST JEAN—Young, January; Netex Oil & Gas Co. 1 B. W. Ling, Blk. 293, TE&L Sur., Strawn, 3,108-25 ft., 125 bbl. of oil, TD 3,125 ft.

WILLIAM & JACK—Stephens, July; Oil Associates, Inc., 1-A Black, 23-4-SPRR, Strawn, 4,065-77 ft., 71 bbl. of oil, TD 4,078 ft.

WOLFE, NORTHWEST—Jack, March; J. C. Jennings 1 J. R. Clayton, Caddo, 4,502-18 ft., 364 bbl. of oil, TD 4,685 ft.

WOODSON, SOUTH—Throckmorton, October; Warren Oil Corp. 1 R. Mathiews, Sec. 670, TE&L Sur., Mississippian, 4,368-75 ft., 464 bbl. of oil, TD 4,375 ft.

WICHITA COUNTY REGULAR—Wichita, February; C. W. Snoddy 1 F. L. Cruse, K&N Subd., Cherokee CSL, Strawn, 3,861-83 ft., 57 bbl. of oil, TD 3,883 ft.

WICHITA COUNTY REGULAR—Wichita, September; Frank Wood, Inc., 1 Wichita Water District 2, Robert Evans Sur., Strawn, 4,320-44 ft., 57 bbl. of oil, TD 4,344 ft.

WILBARGER COUNTY REGULAR—Wilbarger, June; Gray Oil Co. 3 W. T. Waggoner "E," Sec. 19 BS&F, Cisco sand, 1,520-1,823 ft., 70 bbl. of oil, TD 1,873 ft.

YOUNG COUNTY REGULAR — Young, March; J. W. Hastings 1 C. W. Johnson, Blk. 10, E. W. Sargeant Sur., Canyon (?), 3,136-98 ft., 120 bbl. of oil, TD 3,198 ft.

YOUNG COUNTY REGULAR — Young, June; Reno Oil Co. 1 Pemeta, Blk. 1,467, TE&L, Mississippian, 5,025-5,114 ft., 124 bbl. of oil, TD 5,114 ft.

YOUNG COUNTY REGULAR—Young, June; Warren Oil Corp. 1 Orton Bennett, S. H. Evans Sur., A-1,306, Caddo, 3,814-99 ft., 51 bbl. of oil, TD 3,899 ft.

YOUNG COUNTY REGULAR—Young, June; Warren Oil Corp. 1 Marvia Dent, TE&L Sur. 2,387, Caddo, 3,763-73 ft., 111 bbl. of oil, TD 3,773 ft.

YOUNG COUNTY REGULAR—Young, July; E. B. Russell 1 T. E. Loran, A-509, TE&L Sur., Bend, 4,765-75 ft., 864 bbl. of oil, TD 4,775 ft.

YOUNG COUNTY REGULAR—Young, July; Lebus Brothers 1 H. O. Prideaux, A.

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McMillen Sur., Strawn sand, 2,998-3,004 ft., 65 bbl. of oil, TD 3,680 ft.

YOUNG COUNTY REGULAR—Young, August; R. H. Siegfried 1 Allar Co., TE&L Sur. 3,410, Caddo, 3,495-3,505 ft., 112 bbl. of oil, TD 3,539 ft.

YOUNG COUNTY REGULAR—Young, August; Warren Oil Corp. 1 Nash-Daniel Unit, TE&L Sur., A-844, Bend, 4,391-4,404 ft., 344 bbl. of oil, TD 4,404 ft.

YOUNG COUNTY REGULAR—Young, September; Champlin Refining Co. 1 D. D. Strange, A. Rohus Sur., A-240, Strawn, 3,564-72 ft., 146 bbl. of oil, TD 3,572 ft.

YOUNG COUNTY REGULAR—Young, September; R. O. Wood 1-AS Benson, Sec. 1,391, TE&L, Caddo, 4,447-74 ft., 135 bbl. of oil, TD 4,474 ft.

YOUNG COUNTY REGULAR—Young, October; J. W. Hastings 1 W. T. Boyle, BBB&C Sur. 1, A-34, Strawn, 3,508-61 ft., 72 bbl. of oil, TD 3,561 ft.

YOUNG COUNTY REGULAR—Young, October; Lebus Brothers 6-A Hawkins, Sec. 1,914, TE&L Sur., Canyon sand, 2,741-65 ft., 152 bbl. of oil, TD 2,765 ft.

UNNAMED—Archer, February; Perkins & Cullum 1 Conner, A. O. Palmer Sur., A-342, Mississippian, 5,150-75 ft., 839 bbl. of oil, TD 5,175 ft.

UNNAMED—Archer, February; McElroy Ranch Co. 1 L. F. Wilson, Sec. 32, ATNCL Sur., Strawn, 3,809-20 ft., 51 bbl. of oil, TD 3,820 ft.

UNNAMED—Archer, May; Mummert & Holmes 1 Wilson Properties, Sec. 94, Lot 3, ATNCL Sur., Cisco, 1,541-43 ft., 86 bbl. of oil, TD 1,543 ft.

UNNAMED—Archer, June; L. T. Burns 1-A First National Bank of Olney, J. Poitevent Sur. 2, A-1,178, Mississippian, 5,320-32 549 bbl. of oil, TD 5,324 ft.

UNNAMED—Archer, June; Frank Woods Associates, Inc., 1 Frank McAnnally, M. W. Mathews Sur., A-729, Mississippian, 5,387-90 ft., 216 bbl. of oil, TD 5,390 ft.

UNNAMED—Archer, August; Gulf Oil Corp. 45 A. P. Nichols, ATNCL and DL&C Sur., A-959, Ellenburger, 5,394-5,404 ft., 177 bbl. of oil, TD 5,469 ft.

UNNAMED—Archer, September; Bay Petroleum Co. 1 Martha Campbell, A. E. Hill Sur., A-1,100, Mississippian, 5,360-78 ft., 153 bbl. of oil, TD 5,378 ft.

UNNAMED—Archer, December; Russell Maguire 1 Minnie Decker, SPRR Sur. 2, A-1,187, Ellenburger, 5,725-43 ft., 80 bbl. of oil, TD 5,743 ft.

UNNAMED—Baylor, June; Reno Oil Co. 1-C Cowan, Sec. 198 & 199, T&NO Sur., Canyon reef, 2,568-75 ft., 94 bbl. of oil, TD 2,578 ft.

UNNAMED—Baylor, September; J. J. Lynn 1 First National Bank of Bowie, Sec. 209, T&NO Sur., Strawn, 4,747-52 ft., 130 bbl. of oil, TD 4,752 ft.

UNNAMED—Callahan, August; Mid-Continent Petroleum Corp. 1-A Odom, W. E. Pledger Sur. 229, Ellenburger, 4,170-77 ft., 159 bbl. of oil, TD 4,177 ft.

UNNAMED—Callahan, August; Magnolia Petroleum Co. 1 Elma Jackson, Sec. 115, BBB&C Sur., Ellenburger, 4,417-33 ft., 317 bbl. of oil, TD 4,442 ft.

UNNAMED—Callahan, October; Clark & Cowden 1 J. W. Gray, Sec. 46, BBB&C Sur., 1,798-1,810 ft., 117 bbl. of oil, TD 1,810 ft.

UNNAMED—Callahan, October; McElroy Ranch Co. 1-B E. W. McCollum, Sec. 2,190, TE&L Sur., Caddo, 3,229-35 ft., 135 bbl. of oil, TD 3,256 ft.

UNNAMED—Clay, April; L. T. Burns 1 S. R. Peterson, J. H. Belcher Subd., Strawn, 4,420-4,500 ft., 103 bbl. of oil, TD 4,500 ft.

UNNAMED—Clay, May; Deep Rock Oil Co. 1 Gossett, J. Diaz Sur., A-110, Caddo, 4,029-53 ft., 136 bbl. of oil, TD 4,053 ft.

UNNAMED—Clay, August; Armour Properties 1-A G. W. Scaling, J. H. Belcher Subd., Strawn, 4,480-4,506 ft., 172 bbl. of oil, TD 4,600 ft.

UNNAMED—Clay, August; Deep Rock Oil Corp. 1 Moore Estate, J. Diaz Sur., A-110, Strawn, 3,976-93 ft., 125 bbl. of oil, TD 6,891 ft.

UNNAMED—Clay, August; Stephens Petroleum Co. 1 Vinson, T&NO Sur., Simpson, 6,208-30 ft., 222 bbl. of oil, TD 6,260 ft.

UNNAMED—Coleman, February; Davis & Calvin 1 C. D. Bruce, J. Scott Sur., Breneke, 1,836-49 ft., 80 bbl. of oil, TD 1,849 ft.

UNNAMED—Coleman, March; H. A. Bridwell 1 M. E. Harris, Samuel Sprague Sur. 664, Breneke, 1,849-72 ft., 33 bbl. of oil, TD 1,872 ft.

UNNAMED—Cooke, March; Acme Equipment Co. 5 W. F. Solomon West Ranch, 3-A976-SPRR, Caddo, 2,464-68 ft., 86 bbl. of oil, TD 2,468 ft.

UNNAMED—Eastland, January; Oil Associates, Inc., 1 J. R. Bacon, 50-3-H&TC, Ellenburger, 3,747-68 ft., 62 bbl. of oil, TD 3,778 ft.

UNNAMED — Eastland, January; Bert Fields 1 V. M. Smith, 60-4-H&TC, Ranger sand, 3,644-90 ft., 52 bbl. of oil, TD 3,797 ft.

UNNAMED—Eastland, August; S-J-S Oil Co. 1 C. E. Ragland, Abraham Smeltzer Sur., Cisco, 2,806-10 ft., 169 bbl. of oil, TD 2,810 ft.

UNNAMED—Eastland, December; J. J. Lynn 1 Pippen, Sec. 3,170, TE&L Sur., Ellenburger, 4,036-62 ft., 101 bbl. of oil, TD 4,062 ft.

UNNAMED—Fisher, January; Intex Oil Co. 1 Aud Gerrald, 174-2-H&TC, Ellenburger, 3,429-34 ft., 65 bbl. of oil, TD 6,478 ft.

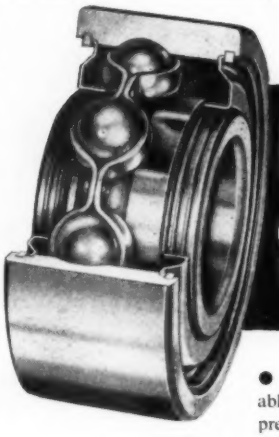
UNNAMED—Fisher, February; Texas Pacific Coal & Oil Co. 1-A R. J. Robertson, 185-1-BBB&C, Cisco, 3,691-94 ft., 47 bbl. of oil, TD 6,235 ft.

UNNAMED—Fisher, April; Stanolind Oil & Gas Co. 1 M. A. Glass, 246-3-H&TC, Ellenburger, 7,328-47 ft., 211 bbl. of oil, TD 7,347 ft.

UNNAMED—Fisher, May; G. E. Kadane 1-A B. L. Carriker, Blk. 2, J. B. Rector Subd., R. H. Hibbitt Sur. 331, Ellenburger, 5,810-55 ft., 140 bbl. of oil, TD 5,854 ft.

UNNAMED—Fisher, July; G. E. Kadane & Sons 1 H. M. Scarbrough, Blk. 2, R. H. Hibbitt Sur., Ellenburger, 5,799-5,838 ft., 72 bbl. of oil, TD 5,838 ft.

UNNAMED—Haskell, April; Humble Oil & Refining Co. 1 W. H. Harrell, J. McClanhan Sur., Bend conglomerate, 5,697-5,718 ft., 87 bbl. of oil, TD 5,718 ft.



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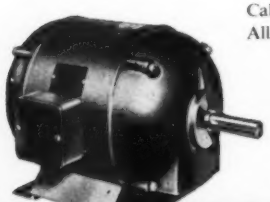

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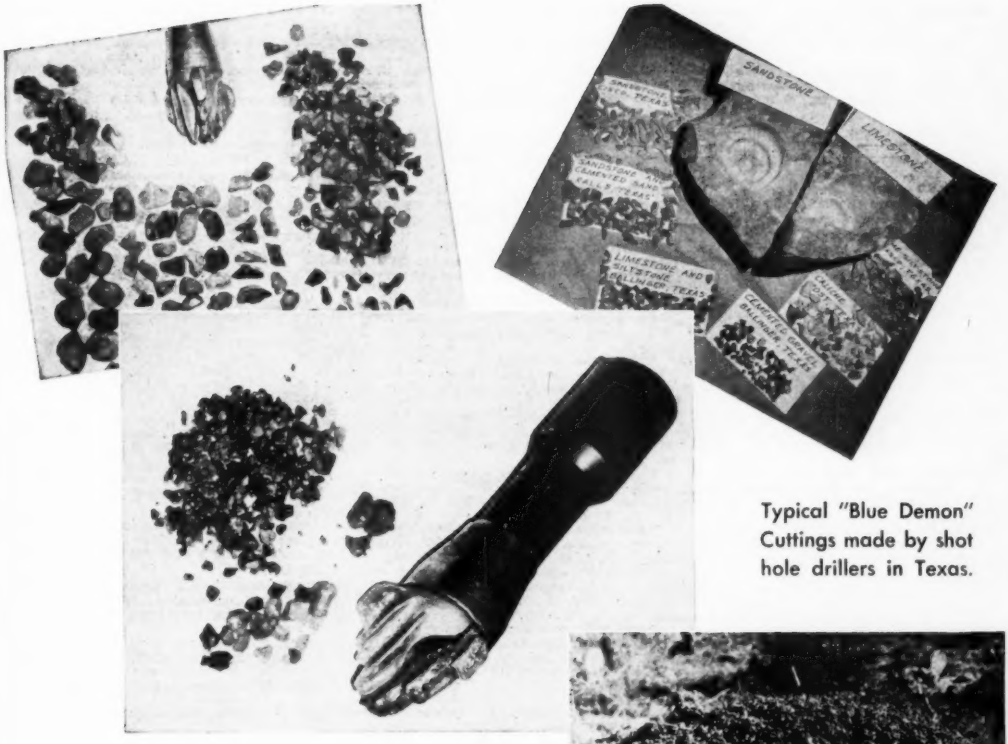
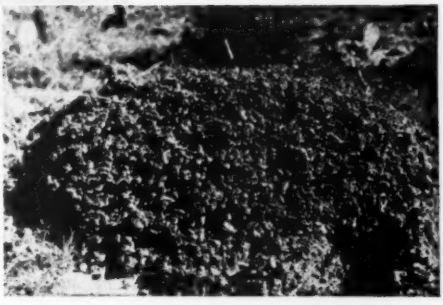


Typical "Blue Demon" Cuttings made by shot hole drillers in Texas.



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REPLACEABLE BLADES 1⅞"-10"

WRITE FOR ILLUSTRATED CATALOG

HERB J. HAWTHORNE INC.

P. O. BOX 7366, HOUSTON 8, TEXAS

UNNAMED—Haskell, April; Continental Oil Co. 1 Maggie Martin, Sec. 38, Wise CSL, Pennsylvanian, 5,792-58 ft., 280 bbl. of oil, TD 6,107 ft.

UNNAMED—Haskell, April; Crown Central Petroleum Corp. 1 W. T. Overby, 48-1-H&TC, Strawn, 4,861-67 ft., 79 bbl. of oil, TD 5,669 ft.

UNNAMED—Haskell, April; Phillips Petroleum Co. 1 Herren, P. H. Anderson Sur., A-3, Strawn, 4,800-02 ft., 93 bbl. of oil, TD 6,100 ft.

UNNAMED—Haskell, August; Humble Oil & Refining Co. 1-D Strickland, Sec. 5, J. McClanahan Sur., Strawn, 5,490-96 ft., 106 bbl. of oil, TD 5,968 ft.

UNNAMED—Haskell, October; Rowan & Hope 1 Anna Mae Hutchinson, Blk. 5, A. Slaydon Sur. 58, Judd, 4,980-86 ft., 116 bbl. of oil, TD 5,001 ft.

UNNAMED—Jack, January; C. G. Glasscock 1-B R. L. Morris, J. B. Earhart Sur., A-210, Bend conglomerate, 5,252-64 ft., 28 bbl. of oil, TD 5,264 ft.

UNNAMED—Jack, January; Coston & Cline 2 T. H. Cherryhomes, J. Kuykendall Sur., A-326, Bend conglomerate, 5,516-30 ft., 131 bbl. of oil, TD 5,656 ft.

UNNAMED—Jack, February; Star Oil Co. 1 M. E. Munson, BS&F Sur. 3, A-82, Bend conglomerate, 4,778-82 ft., 47 bbl. of oil, TD 4,782 ft.

UNNAMED—Jack, May; L. T. Burns 1 A. T. Singleton, M. Rockerfellow Sur., A-484, Canyon sand, 3,024-30 ft., 125 bbl. of oil, TD 3,030 ft.

UNNAMED—Jack, May; Revier Drilling Co. 1-A A. Fowler, W. R. Dean Sur., Bend conglomerate, 5,555-65 ft., 45 bbl. of oil, TD 5,608 ft.

UNNAMED—Jack, May; Rankin & Pitcock 1 A. B. Salter, Samuel Tollett Sur., A-1,436, Caddo conglomerate, 4,952-4,462 ft., 110 bbl. of oil, TD 5,520 ft.

UNNAMED—Jack, May; Star Oil Co. 1 W. E. Ruth, SPRR Sur. 2, A-2,179, Caddo, 4,474-93 ft., 344 bbl. of oil, TD 4,493 ft.

UNNAMED—Jack, November; Rankin & Pitcock 1 Laura Ainsworth, G. Stephenson Sur., A-523, Caddo, 4,300-32 ft., 1,368 bbl. of oil, TD 4,428 ft.

UNNAMED—Jones, January; Con-Tex Petroleum Corp. 1 Pearce & Creed, 5-1-T&NO, Wolfcamp, 2,502-16 ft., 111 bbl. of oil, TD 2,538 ft.

UNNAMED—Jones, January; Robinson-Puckett, Inc. 1 C. L. Hamilton, 15-1-T&NO, Wolfcamp 2,456-60, 68 bbl. of oil, TD 2,468 ft.

UNNAMED—Jones, February; Sojourner Drilling Co. 2 J. L. Crow, 2-2-J. H. Gibson Sur., Swastika, 3,398-3,405 ft., 84 bbl. of oil, TD 3,410 ft.

UNNAMED—Jones, March; Taubert Drilling Co. 1 J. W. Tiner, Blk. 14, S. M. Reynolds Sur., Noodle Creek, 2,478-88 ft., 85 bbl. of oil, TD 4,311 ft.

UNNAMED—Jones, March; West Central Drilling Co. 1 J. M. Alexander, 2-14-T&P, Bluff Creek, 1,580-88 ft., 90 bbl. of oil, TD 1,588 ft.

UNNAMED—Jones, July; G. E. Kadane & Sons 1 W. V. Triplett, Sec. 201, J. J. Hughes Sur., Flippen sand, 2,256-59 ft., 102 bbl. of oil, TD 2,532 ft.

UNNAMED—Jones, July; West Central Drilling Co. 1 W. F. Bumpass, Blk. 262, G. B. Blackburn Sur., Strawn, 4,493-4,545 ft., 136 bbl. of oil, TD 4,545 ft.

UNNAMED—Jones, October; Roark, Hooker and R-H-K Drilling Co. 1 Williams, 42-18-T&P, Swastika, 3,007-10 ft., 61 bbl. of oil, TD 4,817 ft.

UNNAMED—Montague, May; Bob Rucker 1 J. A. Wall, 10-A517-MEP&PRR, Bend conglomerate, 5,852-82 ft., 163 bbl. of oil, TD 6,089 ft.

UNNAMED—Shackelford, February; M. J. Mitchell 2 W. H. Green, Sec. 34, BAL Sur., Ellenburger, 4,357-73 ft., 323 bbl. of oil, TD 4,373 ft.

UNNAMED—Shackelford, March; Deep Rock Oil Corp. 3 Conway, 183-1-ETRR, Bluff Creek, 1,554-48 ft., 47 bbl. of oil, TD 1,960 ft.

UNNAMED—Shackelford, April; C. W. Gore 1 Dean Bros., Sec. 15, LAL Sur., Ellenburger, 4,235-43 ft., 336 bbl. of oil, TD 4,243 ft.

UNNAMED—Shackelford, August; J. G. McMillian et al 1 G. R. Davis, 6-13-T&P, Bluff Creek, 1,624-44 ft., 168 bbl. of oil, TD 1,644 ft.

UNNAMED—Stephens, January; Cities Service Oil Co. 1-B Wright, Sec. 1,538, TE&L Sur., Ellenburger, 4,400-53 ft., 124 bbl. of oil, TD 4,453 ft.

UNNAMED—Stephens, April, Whittmer, Knight & Ewing 1-B L. B. Norvell, Sec. 76, BAL Sur., Ellenburger, 4,215-25 ft., 251 bbl. of oil, TD 4,225 ft.

UNNAMED—Stephens, October; W. D. Brookover 1-A Spears, 29-6-T&P, Strawn sand, 2,200-11 ft., 67 bbl. of oil, TD 2,211 ft.

UNNAMED — Stonewall, January; Sid Katz & R. H. Venable 1 H. D. Dozier, Ruthy Campbell Sur. 50, Strawn, 4,822-34 ft., 132 bbl. of oil, TD 4,834 ft.

UNNAMED—Stonewall, January; Skelly Oil Co. 1 Wm. Flowers, 54-D-H&TC, Canyon sand, 4,166-89 ft., 165 bbl. of oil, TD 4,189 ft.

UNNAMED—Stonewall, May; C. L. Norsworthy 1 T. A. Upshaw, 84-D-H&TC, Caddo, 5,945-70, 248 bbl. of oil, TD 6,110 ft.

UNNAMED — Stonewall, October; Dan Auld 1 E. S. Boyd, 46-D-H&TC, conglomerate, 6,032-43 ft., 427 bbl. of oil, TD 6,043 ft.

UNNAMED—Stonewall, December; Skelly Oil Co. 1 C. E. Boyd, 47-D-H&TC, Bend conglomerate, 6,021-47 ft., 182 bbl. of oil, TD 6,050 ft.

UNNAMED—Taylor, July; Southern Minerals Corp. 1 John Graham, 27-1-SPRR, Gardner sand, 4,438-48 ft., 64 bbl. of oil, TD 4,448 ft.

UNNAMED—Taylor, September; Miami Operating Co., Inc., 1 Joe Bettes, 143-64-H&TC, Caddo, 4,803-21 ft., 65 bbl. of oil, TD 4,848 ft.

UNNAMED — Throckmorton, January; Warren Oil Corp. 1 West Hamilton, A-490-1,651-TE&L, Caddo, 3,748-56 ft., 814 bbl. of oil, TD 4,562 ft.

UNNAMED—Throckmorton, February; R. Graham Cherry 1 J. B. Herrington, Sec. 903, TE&L Sur., Caddo, 4,195-4,202 ft., 189 bbl. of oil, TD 4,202 ft.

UNNAMED—Throckmorton, June; Woodson Oil Co. 1 Gean Buchanan, Sec. 928, TE&L Sur., Caddo, 4,049-59 ft., 456 bbl. of oil, TD 4,800 ft.

UNNAMED—Throckmorton, July; R. G. Drilling Co. 2 N. L. B. Davis, TE&L Sur. 1,620, Strawn, 3,433-38 ft., 54 bbl. of oil, TD 3,438 ft.

UNNAMED—Throckmorton, August; Warren Oil Corp. 1 G. Williams, J. H. Williams Sur., A-1,455, Caddo, 3,565-80 ft., 310 bbl. of oil, Mississippian, 4,367-78 ft., 734 bbl. of oil, TD 4,378 ft.

UNNAMED — Throckmorton, August; Woodson Oil Co. 3-Q R. A. Brown, Sec. 202, BBB&C, Caddo, 4,717-22 ft., 648 bbl. of oil, TD 5,315 ft.

UNNAMED—Throckmorton, October; G. E. Kadane & Sons 1 E. D. Condron, Sec. 1,630 TE&L, Caddo, 4,134-39 ft., 561 bbl. of oil, TD 4,144 ft.

UNNAMED—Throckmorton, October; C. H. Kadane 1 Everett, Sec. 1,615, TE&L Sur., Caddo, 1,064 bbl. of oil, TD 4,759 ft.

UNNAMED—Throckmorton, November; P-M Drilling Co. 1 S. R. Davis, Sec. 3,004, TE&L Sur., Caddo, 4,190-4,201 ft., 782 bbl of oil, TD 4,201 ft.

UNNAMED—Wichita, February; W. H. Hamon 1-B Louise Thomas Cook, K&N Subd., Cherokee CSL, Strawn, 4,861-83 ft., 25 bbl. of oil, TD 4,883 ft.

UNNAMED—Wichita, July; Hunter Bros. 1 S. T. Tuttle, Blk. 180, Waggoner Colony Lands, Ellenburger, 5,760-77 ft., 146 bbl. of oil, TD 5,777 ft.

UNNAMED—Wise, January; T. G. Shaw 1 Frank Menn, B. F. Hines Sur. 64, A-1,127, Strawn sand, 3,159-65 ft., 25 bbl. of oil, TD 4,418 ft.

UNNAMED—Young, January; Greenbrier Oil Co. 1 G. O. Hazelton, W. C. True Sur., A-2,180, Strawn, 3,140-3,233 ft., 36 bbl. of oil, TD 4,589 ft.

UNNAMED—Young, April; Cato Oil Co. 1 E. A. Edwards, Sec. 3,401, TE&L, Caddo, 4,448-65 ft., 49 bbl. of oil, TD 5,161 ft.

UNNAMED—Young, April; Perkins Bros. 1 R. L. Morrison Unit, TE&L Sur. 158, Strawn, 3,327-36 ft., 241 bbl. of oil, TD 5,049 ft.

UNNAMED—Young, June; W. F. Newton 1 Bennie Hilbers, Blk. 59, TEL Sur., Mississippian, 4,884-4,901 ft., 134 bbl. of oil, TD 4,901 ft.

UNNAMED—Young, July; T. V. Gorman 1 F. L. Kelly, TE&L Sur. 158, Olney townsite, Strawn, 3,038-43 ft., 120 bbl. of oil, TD 3,043 ft.

UNNAMED—Young, August; Anzac Oil Corp. 4-A Graham-Harrison, Joseph Allen Sur., A-1,662, Mississippian, 4,301-27 ft., 326 bbl. of oil, TD 4,327 ft.

UNNAMED—Young, November; Reno Oil Co. 1 Frances L. Gregg, Young CSL, A-1,284, Strawn sand, 3,980-88 ft., 212 bbl. of oil, TD 3,988 ft.

UNNAMED—Young, November; Turner & West 1 Mrs. Mattie P. Cunningham, 1,912-A986-TE&L, Strawn, 3,484-94 ft., 101 bbl. of oil, TD 3,718 ft.

UNNAMED—Young, December; Reno Oil Co et al 1 McCracken, Blk. 1,913, TE&L Sur., 3,484-3,501 ft., 115 bbl. of oil, TD 3,501 ft.

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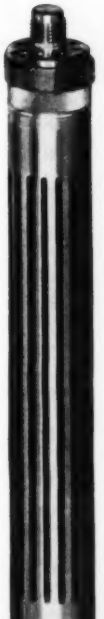

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NEW PAYS

BANKLINE-OWEN — Eastland, March; Bankline Oil Co. 5 Reynolds, 49-4-H&TC, Duffer sand, 3,372-83 ft., 75 bbl. of oil, TD 3,818 ft.

BANKLINE - OWEN — Eastland, March; Bankline Oil Co. 2 Mize-Dulin, 47-4-H&TC, Ranger sand, 3,236-49 ft., 86 bbl. of oil, TD 3,298 ft.

BARRETT—Montague, May; L. W. Barrett 4 McCall-Fooshee, J. G. Cox Sur., A-163, Caddo conglomerate, 6,303-72 ft., 470 bbl. of oil, TD 6,372 ft.

BURNS-RAGLAND—Young, February; L. T. Burns 3 Sarah Williams "A," 357-A504-TE&L, Strawn, 3,172-82 ft., 244 bbl. of oil, TD 3,182 ft.

DALY-CADDO—Wise, July; Warren E. Wright 1 J. D. McAnally, Sec. 56, MEP&P, Caddo, 3,961-97 ft., 80 bbl. of oil, TD 3,997 ft.

EAST HAMLIN-TANNEHILL—Jones, August; Morgan Brown & Ray Ryan 1 C. P. Prichard, 116-1-BBB&C, Tannehill sand, 2,408-18 ft., 85 bbl. of oil, TD 3,400 ft.

FAVER-GUNSITE—Nolan, April; Rowan & Hope 2 Irl Faver, 47-21-T&P, Gunsite, 3,903-25 ft., 97 bbl. of oil, TD 6,217 ft.

FRANKIRK-CANYON — Stonewall, May; Ohio Oil Co. 2-A Anderson, 18-U-T&P, Canyon reef, 5,025-65 ft., 232 bbl. of oil, TD 6,001 ft.

HAMMON (KMA ZONE 3)—Wichita, April; Shell Oil Co. 1-B Birk, Blk. 23, Cowherd Bros. Subd., J. A. Ventress Sur., Strawn, 4,116-40 ft., 93 bbl. of oil, TD 4,789 ft.

HAYTER-MISSISSIPPIAN—Archer, February; British American Oil Co. 1 W. O. Hayter, Sec. 1,598, TE&L Sur., Mississippian, 5,019-40 ft., 198 bbl. of oil, TD 5,209 ft.

HILDRETH-LOWER STRAWN—Montague, April; Wichita River Oil Co. 1 L. Bess, Sec. 58, ETRR Sur., Strawn, 5,540-45 ft., 203 bbl. of oil, OTD 6,382 ft., NTD 5,545 ft.

JOHN ANDERSON - CADDO—Throckmorton, May; Warren Oil Corp. 2 C. C. Robinson, Sec. 1,650, TE&L Sur., Caddo, 4,540-60 ft., 236 bbl. of oil, TD 4,560 ft.

LONE PRAIRIE—Montague, March; W. H. Bryant 4-A A. J. Cox, Blk. 117, Griffin Payne Sur., Caddo, 6,088-6,100 ft., 840 bbl. of oil, TD 6,100 ft.

NORTH COLEMAN JUNCTION—Coleman, September; J. H. Blackwell 1 J. R. Pearce "D," 57-5-Coleman CSL, Jennings sand, 2,092-2,103 ft., 222 bbl. of oil, TD 2,103 ft.

OLD GLORY-STRAWN—Stonewall, February; American Trading & Producing Corp. 1 J. W. Simpson, W. M. Wade Sur., Strawn, 5,032-45 5,057-60 ft., 80 bbl. of oil, TD 6,150 ft.

PRIDEAUX—Young, May; W. L. Hamilton & Pace & Strange, Blk. 4, A. Rohus Sur., Strawn, 2,956-73 ft., 142 bbl. of oil, TD 3,080 ft.

SOJOURNER-UPPER STRAWN—Haskell, April; Eastland Oil Co. 1 J. M. Miller, 41-1-H&TC, Upper Strawn, 4,752-72 ft., completed as oil well, TD 5,309 ft.

SOJOURNER—Haskell, September; A. G. Hill and Roark, Hooker & Roark 1 Wair, 42-1-H&TC, Middle Strawn sand, 4,756-60 ft., 51 bbl. of oil, TD 5,394 ft.

WOLFE-CONGLOMERATE—Jack, March; S. D. Johnson 2 Perkins-Wolfe, G. W. Wright Sur., A-1,442, Bend conglomerate, 4,854-66 ft., 168 bbl. of oil, TD 5,931 ft.

TEXAS PANHANDLE

District 10

NEW POOLS

WOMBLE—Hansford, July; J. M. Huber 1 Man Womble, 27-3-GH&H, Pennsylvanian, 5,266-5,340 ft., 16 bbl. of oil, TD 5,416 ft.

UNNAMED—Ochiltree, May; The Texas Co. 1-B McGarrough, 139-13-T&NO, 3½ mi. NW lips field, Atoka (Pennsylvanian) 8,473-90 and 8,513-20 ft., 260 bbl. of oil, TD 8,540 ft.

SOUTHEAST NEW MEXICO

NEW POOLS

BAGLEY-PENNSYLVANIAN—Lea, April; Amerada Petroleum Corp. 2 W. F. Mathers, 3-12s-33e, Pennsylvanian, 8,650-8,705 ft., 788 bbl. of oil, TD 9,460 ft. 4 wells at year end.

BROWN—Roosevelt, June; Magnolia Petroleum Co. 1 J. B. Brown, 6-7s-34e, Permo-Pennsylvanian, 8,131-43 ft., 175 bbl. of oil, TD 9,067 ft.

CHISHOLM—Chaves, July; McMillan & Peterson 1-A State, 13-11s-27e, San Andres, 2,028-56 ft., 62 bbl. of oil, TD 2,065 ft.

LOVINGTON-STRAWN—Lea, April; Tide Water Associated Oil Co. 1-D State "P," 32-16n-37e, Strawn, 11,080-180 ft., 767 bbl. of oil, TD 12,572 ft.

SAUNDERS, NORTH—Lea, January; The Texas Co. 1 State AN, 22-14s-33e, Pennsylvanian, 9,875-9,905 ft., 288 bbl. of oil, TD 9,905 ft.

UNNAMED—Lea, March; Paul C. Teas 1 Bernice Dinnin, 24-20s-33e, Yates sand, 3,361-64 ft., 124 bbl. of oil, TD 3,373 ft.

UNNAMED—Lea, April; Lawton Oil Co. 1-A State, 30-15s-33e, Pennsylvanian, 10,587-617 ft., 336 bbl. of oil, TD 10,621 ft.

UNNAMED—Eddy, April; Geo. D. Riggs 1 Welch, 5-21s-27e, Trinity sand, 541-551 ft., 100 bbl. of oil, TD 551 ft.

UNNAMED—Lea, August; The Texas Co. 1-AS State, 6-15s-32e, Wolfcamp, 9,700-27 ft., 1,408 bbl. of oil, TD 9,802 ft.

UNNAMED—Lea, August; Amerada Petroleum Corp. 1 ECA-State, 14-12s-32e, Devonian, 11,260-70 ft., 550 bbl. of oil, TD 11,314 ft.

UNNAMED—Lea, August; The Texas Co. 1-AR State, 2-11s-37e, Devonian, 11,500-80 ft., 319 bbl. of oil, TD 11,580 ft.

UNNAMED—Lea, November; Skelly Oil Co. 1-K Mexico, 29-24s-38e, 6,616-6,720 ft., flowed oil, TD 13,145 ft. 2 wells at year end.

UNNAMED—Lea, November; Forest Oil Corp. 1 Lowe, 25-13s-37e, Pennsylvanian, 10,126-72, 385 bbl. of oil, TD 13,145 ft.

UNNAMED—Lea, November; Fullerton Oil Co. 1 Elliott, 1-21s-37e, McKee, 8,005-46 ft., 245 bbl. of oil, TD 8,370 ft.

UNNAMED—Lea, December; Magnolia Petroleum Co. 1 Black, 9-15s-36e, Pennsylvanian, 11,440-503 ft., 156 bbl. of oil, TD 11,503 ft.

NEW PAY

LOVINGTON—Lea, December; Skelly Oil Co. 9-0 State, 31-16s-37e, Clear Fork, 8,400-30 ft., 881 bbl. of oil, TD 8,500 ft.

NORTH LOUISIANA

NEW POOLS

ATHLONE—Concordia, December; Barnett Serio 1 Wilds, SW SW 7-7n-7e, 20 bbl. oil, Wilcox, 5,131-32 ft., TD 5,510 ft.

BELLEVUE, EAST—Webster, September; Skelly Oil Co. 1 E. L. Stewart, 466 ft. N. and E SWc 19-19n-10w, Pettit, 3,978-86 ft., 3,990-98 ft., 4,006-09 ft., 151 bbl. oil, TD 7,780 ft. 3 wells at year end.

CASH POINT—Caddo, September; Butler-Johnson Well Service, Inc., 1 Sentell, 1,042 ft. S and 3,186 ft. E NWc 35-19n-14w, Cotton Valley, Bodcaw sand, 8,324-46 ft., 16,000 M.c.f. gas, TD 8,352 ft.

CATAHOULA LAKE, NORTH—La Salle, August; Carter Oil Co. - State Catahoula, 4,620 ft. S and 3,300 ft. W NEc 22-7n-4e, Wilcox, 4,112-14 ft., 108 bbl. oil, TD 5,400 ft.

COCODRIE BAYOU—Concordia, November; Hunt Oil Co. and Gulf Refining Co. 1 Yakey, C NW NW 29-4n-8e, Wilcox, 6,944-48 ft., 80 bbl. oil, TD 7,500 ft.

COCODRIE BAYOU, WEST—Concordia, November; Hunt Oil Co. and Gulf Refining Co. 2 Yakey, C SE SW 42-4n-8e, Wilcox, 6,552-56 ft., 49 bbl. oil, TD 7,500 ft. 2 wells at year end.

LISEMORE LANDING—Concordia, July; Hunt and Gulf Refining Co. 2 Fisher Lumber Co. "E," C NE SW 15-6n-7e, Wilcox, 5,294-98 ft., 187 bbl. oil, TD 7,003 ft. 4 wells at year end.

MITTEN LAKE—Catahoula, February; Hunt Oil and Gulf Refining Co. 27 Delta Hardwood & Lumber Co., Inc., et al, 660 ft. N and 1,980 ft. E SWc 27-4n-5e, Wilcox, 5,895-99 ft., 76 bbl. oil, TD 7,500 ft.

ROGERS—La Salle, May; J. S. Michael Co. et al 2-C Nebo Oil Co., C NW NE 9-6n-3e, Wilcox, 3,984-90 ft., 309 bbl. oil, TD 4,514 ft.

UNNAMED—Avoyelles, February; Gulf Refining Co. and Humble Oil & Refining Co. 2 Altheimer, CWL NE SE 24-4n-4e, Wilcox, 4,442-45 ft., 63 bbl. oil, TD 6,518 ft.

UNNAMED—Caddo, June; Roberts & Smith, NW NW NE 22-19n-15w, Paluxy, 2,410-19 ft., 55 bbl. oil, TD 2,520 ft.

UNNAMED—Caddo, June; D. C. Carnes et al 1 Slattery, 250 ft. N and 700 ft. W SEc SW 15-19n-15w, Paluxy, 2,432-50 ft., 30 bbl. oil, TD 2,559 ft. 3 wells at year end.

NEW PAYS

ADA—Bienville, January; Carter Oil Co. 1 Bates-Burson, 2-17n-8w, anhydrite stringer, 5,328-32 ft., 177 bbl. oil, TD 5,422 ft.

BELLEVUE, EAST — Webster, October; October; Halsey & Stewart 1 Crichton, 2,000 ft. N and 2,006 ft. E SWc 7-19n-10w, Tuscaloosa, 2,462-67 ft., 35 bbl. oil, TD 3,839 ft.

CADDO-PINE ISLAND—Caddo, March; Gulf Refining Co. 279-N Caddo Levee Board, SW NE SW 11-20n-16w, Pettit, 4,976-88 ft., 10,000 M.c.f. gas, with 14 bbl. cond. per 1,000 M.c.f. gas, TD 7,993 ft.

HAYNESVILLE, EAST—Claibourne, May; Brooks Drilling Co. and Midstates Oil Co. 1 M. L. Hunt, W/2 NE NE 21-23n-7w, Gloyd, 4,458-61 ft., 30 bbl. oil, TD 5,196 ft.

KNOWLES — Lincoln, July; Southwest Gas Producing Co. A-1 Peterson, 985 ft. S and 954 ft. W NEc 25-20n-4w, Woodruff, 4,928-60 ft., 192 bbl. oil, TD 4,961 ft.

SIBLEY—Webster, November; Atlantic Refining Co. 1 Holley, 1,880 ft. S and 660 ft. W NEc 26-18n-9w, Pettit and Travis Peak, 6,756-84 ft. and 8,570-88 ft., 659 M.c.f. gas, TD 10,863 ft.

SIMSBORO — Lincoln, March; C. H. Murphy & Co. and Pan American Southern 1 W. A. Givens, 1,410 ft. S and 1,310 ft. E NWc 11-17n-4w, James, 5,714-26 ft., Travis Peak, 6,528-48 ft., 8,625 M.c.f. gas, TD 10,100 ft.

SIMSBORO — Lincoln, April; C. H. Murphy & Co. and Pan American Southern 2 W. A. Givens, 1,522 ft. N and E of SWc 2-17n-4w, Rodessa, Fowler sand, 5,330-50 ft., and Hill sand, 5,436-65 ft., 9,400 M.c.f. gas, TD 6,998 ft.

TROUT CREEK—La Salle, January; H. W. Todd et al 4 S. B. Whatley, 1,649 ft. S and 1,626 ft. E NWc of Sec. 19-8n-3e, Sparta, 1,518-23 ft., 25 bbl. oil, TD 1,526 ft.

SOUTH LOUISIANA

NEW POOLS

ANGIE—Washington, July; Humble Oil & Refining Co. 1 Gaylord Container Corp., 47-1s14e, Lower Tuscaloosa, 9,004-10 ft., 296 bbl. of cond., TD 9,059 ft. 4 wells at year end.

BAY COQUILLE—Plaquemines, June; The California Co. 1 Louisiana State Lease 1,784, in Bay Coquille, 7,704-09 ft., 168 bbl. of oil, TD 11,200 ft. 3 wells at year end.

BLIND BAY—Plaquemines, June; The Texas Co. A-1 State Lease-Blind Bay, 22s-21e, 8,363-71 ft., 97 bbl. of oil, TD 10,142 ft.

CLOVELLY—La Fourche, March; Superior Oil Corp. 1 Clovelly Corp., 33-18s-22e, 12,305-15 ft., 194 bbl. of oil, TD 13,930 ft. 3 wells at year end.

COWPEN CREEK—Beauregard, February; Fidelity Oil & Royalty Co. and Logging Co., 1 Edgewood Land, 18-6s-19w, Miocene, 8,522-46 ft., 167 bbl. of oil, TD 9,352 ft. 2 wells at year end.

GROSSE TETE—West Baton Rouge, May; Sohio Petroleum Co. B-1 A. Wilbert & Sons, 31-7s-11e, 10,030-36 ft., 53 bbl. of cond., TD 10,145 ft.

HAPPY TOWN—St. Martin, December; The Texas Co. B-1 Iberville Land Co., 84-7s-7e, 9,654-64 ft., 136 bbl. of oil, TD 10,623 ft.

LAKE COQUILLE—Plaquemines, February; The California Co. 1 State Lease 1786, 22-19s-18e, Lower Miocene, 11,394-406 ft., 400 bbl. of oil, TD 11,500 ft. 4 wells at year end.

LAKE MAUREPAS—Livingston, March; Roeser & Pendleton 1 State Lease 1468, in Lake Maurepas, 9,815-50 ft., 320 bbl. of oil, TD 10,270 ft. 5 wells at year end.

PATTERSON—St. Mary, February; Sun Oil Co. et al., 1 Zenor, 42-15s-11e, Lower Miocene, 11,385-92 ft., 18,000 M.c.f. of gas, TD 13,596 ft.

REEVES—Allen, May; Niloco Co. & Bel Oil Corp. 1 Bel-Krause, 25-6s-7w, Frio, 5,888-90 ft., 53 bbl. of oil, TD 7,515 ft. 2 wells at year end.

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PROBLEM	SOLUTION	RESULT
1. **Mt. Holley, Arkansas.** 5½" 17# cemented casing had a dog leg above zone to be perforated. Solid perforators could not pass kink.	McCullough Glass Jet Perforator with Flexible Steel Strip Carrier successfully passed bad spot perforating desired zone.	Oil operator reported very satisfactory production.
2. **Edmonton, Canada.** 200' of 10¾" surface casing parted from the main string; settled at an angle, resisted all corrective measures. Abandoning seemed necessary.	McCullough Bottom Hole Jet Cutter was arranged to make a flare at the top of the casing that had been dropped.	Flare acted as an adaptor, permitting the bit to pass without hanging up. Well was saved and completed without further trouble from this source.
3. **Los Angeles, California.** Major operator wanted to speed-up setting of bridging plugs. He had formerly dumped in cement, let it set, then tested it on the pump for several days.	a. McCullough Type "B" Expandable Bridging Plug was set in the well on an electric wire line. b. McCullough Gun Tester was used to test the plug.	Several days of rig time were saved over former methods. Bridging plug was later drilled up with a used rock bit in the usual time of 30 minutes.
4. **Ely, Nevada.** Drill pipe was stuck and the McCullough Back-Off Service was called to back-off the pipe at the drill collars.	Operator agreed to have the McCullough Magna-Tector run first to find out EXACTLY where the pipe was stuck.	Magna-Tector indicated that only the bit was stuck and after working all the pipe was freed eliminating costly fishing.
5. **Long Beach, California.** Salvage operator purchased well from major oil company for salvage and abandonment. But decided to run a gamma ray log first.	McCullough Radiation Well Logger located new producing zone that had been missed completely during other logging operations.	After perforating with McCullough Burrless Bullets, this well produced 200 B/D.
6. **Victoria, Texas.** Other wells in same area had been tested to flow from 200# to 800# on 9/16" choke. Operator wanted better perforations and a better well.	12 McCullough Burrless Bullets were shot through the 5½" 17# casing in a two foot zone.	During test well came in immediately, flowing a 2" stream of pipe line oil at 880# pressure on ¼" choke.
7. **Brea Canyon, California.** Operator had been informed that it was impossible to back-off a joint below the bumper sub, the bore of which was only 1¼".	McCullough arranged a short String Shot with a special sinker bar for the purpose.	Back-off job completed although it was thought impossible to do.
8. **Huntington Beach, Calif.** Drill pipe had to be backed-off in a well 74° off vertical.	McCullough Jet Back-Off Tool reached desired joint and was fired.	All free pipe was recovered in one undamaged section.
9. **Houston, Texas.** Salvage operator wanted to speed-up removal of casing from abandoned well. Former methods required several days, sometimes several weeks.	a. McCullough Magna-Tector quickly located the exact stuck point. b. McCullough Jet Casing Cutter instantly severed casing above stuck point.	Time required: One hour and fifteen minutes. (Including rigging up and removing equipment.)
10. **Wyoming Wildcat.** Production of 60 B/D below expectations of this operator.	Well was re-perforated with McCullough Glass Jet Perforator and Flexible Steel Strip Carrier.	After perforating production increased from 60 B/D to 300 B/D.

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September; Shell Oil Co. 1 State Lease 1799, Ship Shoal Block 23, Miocene, 2,657-62 ft., 1,432 M.c.f. of gas, TD 14,000 ft.

PELTO BLOCK 20, SOUTH—Terrebonne, August; Magnolia Petroleum Co. A-1 State Lease 794, Offshore, South Pelto Block 20, Miocene, 8,182-92 ft., 42 bbl. of cond., TD 9,228 ft.

VINTON, NORTH—Calcasieu, February; Sun Oil Co. 1 Brooks, C NE SW 20-10s-12w, Miocene, 10,868-80 ft., 41 bbl. of oil, TD 11,002 ft.

UNNAMED—Acadia Parish, July; Bates & Cornell 1 Mrs. L. E. Frey, 31-7s-1e, 9,650-56 & 9,438-46 ft., 210 bbl. of oil, TD 10,143 ft.

UNNAMED—Avoyelles Parish, July; Sohio Petroleum Co. & Pan-Am Southern Corp. 1 Bordelon, 36-2n-5e, Wilcox, 8,407-11 ft., 160 bbl. of oil, TD 9,004 ft.

UNNAMED—Beauregard, July; William Herbert Hunt 1 Powell Lumber Co., 36-6s-12w, 8,323-30 ft., 132 bbl. of oil, TD 9,165 ft.

UNNAMED—Cameron, October; Pan-American Production Co. 1 Miami Corp., 4-15s3w, 12,362-72 ft., 130 bbl. of cond., TD 12,706 ft.

UNNAMED—Iberville, October; Glassell & Glassell 1 A. M. Cotton et al., "A," 47-9s-9e, 8,780-8,816 ft., 161 bbl. of oil, TD 10,239 ft.

UNNAMED—La Fourche Parish, July; Humble Oil & Refining Co. 1 LI&E "C," 30-19s-23e, 9,166-69 ft., 269 bbl. of cond., TD 13,387 ft.

UNNAMED—Orleans Parish, July; The Texas Co. 1 State-Lake Borgne, Lake Borgne, 7,197-221 ft., 3,198 M.c.f. of gas, TD 13,270 ft.

UNNAMED—Plaquemines Parish, August; Shell Oil Co. 1 State Lease 1961, Twp. 18s-18e, 7,507-11 & 7,516-20 ft., 27 bbl. of cond., TD 10,000 ft.

UNNAMED—St. Mary, May; Shell Oil Co. 1 State Lease 1593, Twp. 18s-10e, 9,535-42 ft., 34 bbl. of cond., TD 14,697 ft.

UNNAMED—Terrebonne, December; Humble Oil & Refining Co. 1 L. L. & E. "D," 32-19s-20e, Bayou Jean La Croix area, 13,231-34 ft., 206 bbl. of oil, TD 13,678 ft.

NEW PAYS

AVERY ISLAND—Iberia, January; Humble Oil & Refining Co. B-21 Petit Anse Co., 23-13s-5e, Miocene, 12,779-85 ft., 641 bbl. of oil, TD 12,790 ft.

BAY COQUILLE—Plaquemines, September; The California Co. 6 Louisiana State Lease 1785, 20-19s-18e, 9,548-56 ft., 178 bbl. of oil, TD 11,106 ft. 2 wells at year end.

BURTVILLE—East Baton Rouge, February; Shell Oil Co. 2 V. J. Gianelloni, 50-8s-1e, Miocene, 9,701-06 ft., 250 bbl. of oil, TD 11,085 ft.

CHACAHOULA—La Fourche, February; Sun Oil Co. 2 Leveret- Morvant Co., 58-14s-15e, Lower Miocene, 14,200-02 ft., 502 bbl. of oil, TD 14,506 ft.

COTE BLANCHE ISLAND—St. Mary, December; The Texas Co. 20 Cote Blanche Island, 14,387-14,426 ft., 456 bbl. of oil, TD 14,446 ft.

COX BAY—Plaquemines, May; Richardson & Bass 20-H State Lease 1794-Cox Bay Unit, 17-18s-16e, 8,500-03 ft., 300 bbl. of condensate, TD 11,335 ft. 3 wells at year end.

DARROW—Ascension, April; Temple Hargrove and The Texas Co. 1 Guiluzzo Unit 1, 49-10s-2e, 9,899-911 ft., 226 bbl. of oil, TD 11,550 ft.

FAUSSE POINTE—Iberia Parish, August; The Texas Co. 6 Lking-Walet, 21-11s-8e, 14,198-200 ft., 468 bbl. of oil, TD 15,512 ft.

FORDOCHE—Pointe Coupee, February; The Texas Co. 1 State-Reno et al. Unit 1, 37-5s-8e, Sparta, 10,420-36 ft., 132 bbl. of oil, TD 10,680 ft. 2 wells at year end.

FOUR ISLE DOME—Terrebonne, June; Superior Co. 2 Louisiana Land & Exploration, 15-21s-16e, 10,952-65 ft., 235 bbl. of oil, TD 12,226 ft.

GROSSE TETE—West Baton Rouge, September; Sohio Petroleum Co. 2 A. Wilbert & Sons "B," 31-7s-11e, 9,696-705 ft., 56 bbl. of condensate, TD 9,942 ft.

HURRICANE CREEK—Beauregard, January; Magnolia Petroleum Co. N-1 Doornbos-McPherson, 23-5s-8w, Wilcox, 14,530-73 ft., 1,512 bbl. of oil, TD 14,573 ft. 2 wells at year end.

IOWA—Calcasieu, October; Louis J.

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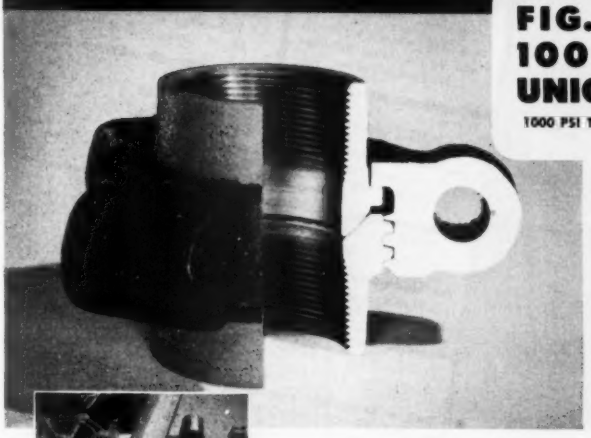
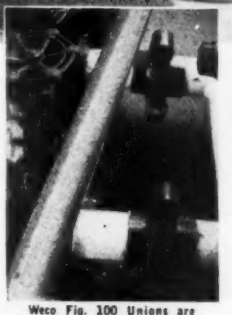
1000 PSI TEST





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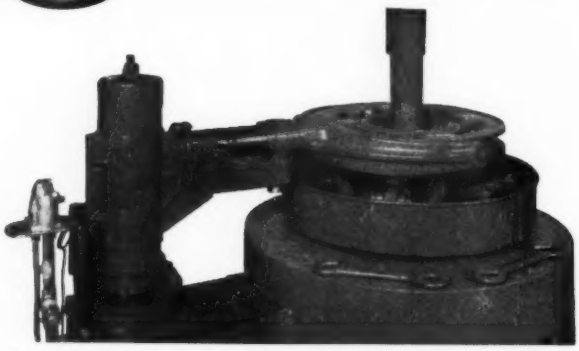

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Roussel 2 R. Haggart et al, 11-9s-7w, 11,023-34 ft., 332 bbl. of condensate, TD 11,140 ft. 2 wells at year end.

LAKE COQUILLE—Plaquemines, February; The California Co. 1 State Lease 1785, 20-19s-18e, Lower Miocene, 10,582-94 ft., 159 bbl. of oil, TD 10,624 ft. 3 wells at year end.

MALLARD BAY—Cameron, December; Mar-Tex Realization Corp. 2 A. S. White, 14-13s-3w, 10,348-70, 67 bbl. of cond., TD 10,471 ft.

NAPOLEONVILLE — Assumption, June; American Republics Corp. 1 Alex Simoneaux, 43-12s-13e, 5,436-46 ft., 88 bbl. of oil, TD 5,530 ft. 5 wells at year end.

PLUMB BOB—St. Martin, October; The California Co. 1 State Lease 1882-St. Martin Land Co., 27-8s-7e, 10,588-96 ft., 166 bbl. of oil, TD 12,000 ft.

SHIP SHOAL BLOCK 72—Terrebonne, January; Magnolia Petroleum Co. B-1 State Lease 768, Offshore-Ship Shoal Blk. 72, Miocene, 10,048-54 & 11,036-42 ft., 510 bbl. of oil, TD 12,066 ft.

SHIP SHOAL BLOCK 72 (OFFSHORE)—Terrebonne Parish, July; Magnolia Petroleum Co. B-2 State Lease 768, Miocene, 9,932-56 ft., 527 bbl. of oil, TD 11,150 ft.

SOUTH PASS BLOCK 24—Plaquemines, January; Shell Oil Co. 2 State Lease 998, Twp. 24s-31e, Miocene, 7,885-88 & 7,891-95 ft., 433 bbl. of oil, TD 9,300 ft. 2 wells at year end.

ARKANSAS

NEW POOLS

ARKANSAS GAS AREA, NORTH—Johnson, July; Pure Oil Co. 2 Low Gap Unit, C NE NW NE 33-12n-24w, Atoka, 1,273-87 ft., 430 M.c.f. gas, TD 2,015 ft.

RAMSEY CREEK—Union, January; Roberts Petroleum Co., Inc., 1 Ramsey, C SE SE SE 23-17s-14w, Travis Peak, 2,900-2,904 ft., 140 bbl. oil, TD 2,908 ft. 4 wells at year end.

SPIRIT LAKE—Miller, April; Lee and Markham Co. 1 Price, 150 ft. NE of C SE NW 18-16s-25w, Paluxy, 3,311-14 ft., 15 bbl. oil, TD 4,368 ft. 6 wells at year end.

UNNAMED—Miller, September; Stanolind Oil & Gas Co. 1 Miller Land & Lumber Co. "A," C NW SE 20-18s-27w, Rodessa Hill sand, 6,056-65 ft., 62 bbl. oil, TD 6,519 ft.

WILKS (REVIVED)—Union, May; C. H. Murphy & Co. 1 Gottschall, NE SE 3-18s-18w, Cotton Valley, 6,769-77 ft., 91 bbl. oil, TD 7,894 ft.

WILLISVILE—Nevada, April; J. B. Warmack et al 1 L. P. Weaver, NEc W/2 SE SW 17-14s-21w, Nacatoch, 1,192-1,200 ft., 5 bbl. oil, TD 1,202 ft. 5 wells at year end.

NEW PAYS

BEAR CREEK—Union, September; Herbert Herff et al 2 Annie Smith, C NE NE NE 17-16s-17w, Travis Peak, 3,916-22 and 3,924-30 ft., 120 bbl. oil, TD 6,395 ft.

EL DORADO—Union, July; C. J. Saulsbury and Sons 1 T. Allen, C NW SE SE 18-17s-14w, Travis Peak, 2,911-13 ft., 320 bbl. oil, TD 3,612 ft.

EL DORADO, EAST—Union, October; Pan Am Southern Corp. 1 Ezzell, 589 ft. S and W NEc SW NE 13-17s-15w, Cotton Valley, 5,026-28 ft., 23 bbl. oil, TD 6,366 ft.

EL DORADO, EAST—Union, September; Murphy Corp. 1 J. W. Robertson "A," C SE NE 33-18s-14w, Travis Peak, 3,620-26 ft., 18 bbl. oil, TD 4,006 ft.

FT. LYNN—Miller, September; Stanolind 1 Miller Land & Lumber Co. "A," C NW SE 20-18s-27w, Rodessa Hill sand, 6,056-65 ft., 62 bbl. cond., TD 6,519 ft.

HOLLY—Ouachita, November; Lion Oil Co. 3 Solomon, NE NW SE 25-15s-18w, Travis Peak, 3,000-05 ft., 150 bbl. oil, TD 3,305 ft.

SCHULER, EAST—Union, May; Atlantic Refining Co. 2 Bishop, SE NW SW 13-18s-17w, Pettit, 3,927-32 ft., 139 bbl. oil, TD 4,001 ft.

SCHULER, EAST—Union, June; C. A. Kincaid et al 1 Burns, SW NE SW 13-18s-17w, Smackover lime, 7,624-26 ft., 120 bbl. oil, TD 7,692 ft.

SMACKOVER—Union, May; A. B. Turner 1 Saxon, CW/2 Lot 2 in NW 4-16s-16w, Travis Peak, 2,936-46 ft., 189 bbl. oil, TD 6,063 ft.

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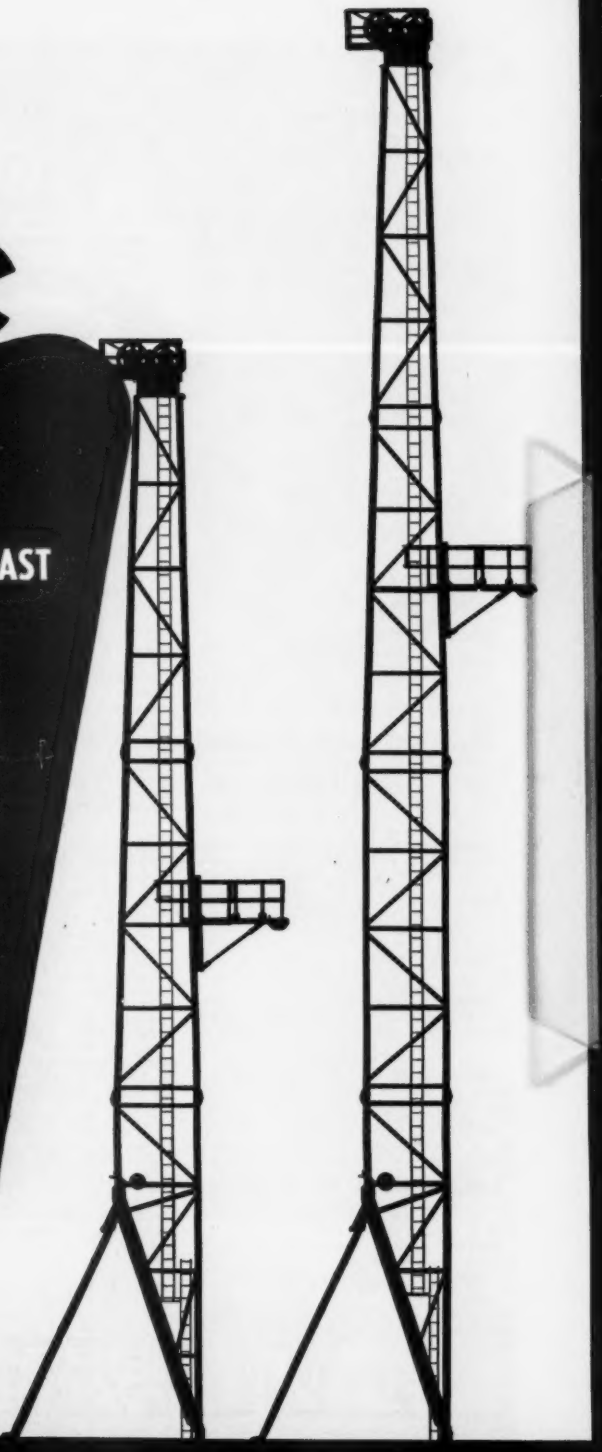

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WILKS—Union, May; C. H. Murphy & Co. 1 Gottschall, 540 ft. N and 620 ft. W SEc NE SE 3-18s-18w, Cotton Valley, 6,769-77 ft., 91 bbl. oil, TD 7,894 ft.

MISSISSIPPI

NEW POOLS

COWPEN POINT—Adams, October; Humble Oil & Refining Co. B-2 James S. Giles, 4-7n-3w, Wilcox, 5,287-91 ft., 180 bbl. oil, TD 6,509 ft.

FAYETTE, SOUTH—Jefferson, March; Sinclair Oil & Gas Co. 1 R. T. Liddell, et al. 67-9n-1e, lower Tuscaloosa, 10,071-82 ft., 265 bbl. cond., TD 10,278 ft.

FREEWOODS—Franklin, October; Lion Oil Co. 1 Thomas, 3-4n-1e, Wilcox, 6,381-87 ft., 110 bbl. oil, TD 7,218 ft.

GARDENS—Adams, May; Kemp Drilling Co., Inc., 1 Ruth M. Gilbert, et al, 12-7n-3w, Wilcox, 4,403-05 ft., 53 bbl. oil, TD 6,513 ft.

KNOXVILLE TOWER—Franklin, November; Hunt Oil Co. 1 U. S. A., 20-5n-2e, Wilcox, 6,465-69 ft., 100 bbl. oil, TD 11,190 ft.

LESSLEY, NORTH—Wilkinson, May; Jon Brooks, Jr., and Peterson Drilling Co. 1 Louis Was, 36-3n-3w, 7,299-7,302 ft., 250 bbl. oil, TD 8,461 ft.

NEW ERA—Adams, January; R. J. Bartlett-Barnett Serio 1 Geo. W. Armstrong, 37-6n-3w, Wilcox, 6,325-27 ft., 88 bbl. oil, TD 6,761 ft. 2 wells at year end.

OVERTON—Adams, January; Southern Production Co. and William Helis B-1 George Armstrong, 19-5n-2w, Braksdale, 6,510-16 ft., 104 bbl. oil, TD 6,763 ft. 2 wells at year end.

PELLUCID BAYOU—Adams, July; R. J. Bartlett-Kemp Drilling Co. B-1 Minter, 52-5n-1w, Wilcox, 6,698-700 ft., 105 bbl. oil, TD 7,014 ft.

PISTOL RIDGE—Forrest, January; I. P. LaRue 1 Creosote Oil Corp., 7-1s-13w, 7,722-26 ft., 27 bbl. cond. TD 9,010 ft.

VIRILLA—Madison, July; Continental Oil Co. 1 John R. Cameron, 36-10n-1e, Hosston gravels, 10,559-63 ft., 209 bbl. oil, TD 14,258 ft.

WAYSIDE—Adams, November; Magnolia Petroleum Co. 1 Netterville-Kendall Unit, 12-5n-1w, Wilcox, 6,496-99 ft., 160 bbl. oil, TD 7,515 ft. 2 wells at year end.

WHITE APPLE, SOUTH—Franklin, September; Dave Gammill-Lyle Cashion Co. 1 D. F. Anderson, 3-5n-1e, Baker, 6,265-66 ft., 92 bbl. oil, TD 7,010 ft.

UNNAMED—Adams, December; Austin E. Stewart 1 F. M. McGehee, 41-8n-1w, Sparta, 3,001-03 ft., 1,612 M.c.f. gas, TD 6,515 ft.

UNNAMED—Forrest, October; I. P. LaRue-American Liberty Oil Co. 1 Crosby Forest Products Co. 17-1s-13w, lower Tuscaloosa, 8,074-85 ft., 103 bbl. cond., TD 8,343 ft.

UNNAMED—Franklin, September; Sun Oil Co. 1 J. D. Seab, 45-6n-1e, Wilcox, 6,423-26 ft., 96 bbl. oil, TD 7,004 ft.

UNNAMED—Jefferson, December; Magnolia Petroleum Co. 1 Noland Est., 10-9n-1e, Wilcox, 3,856-64 ft., 82 bbl. oil, TD 3,909 ft.

NEW PAYS

BAXTERVILLE—Lamar, April; Gulf Refining Co. G-2 Virgil Davis, 7-1n-16e, Wilcox, 5,074-86 and 5,168-78 ft., 19 bbl. cond. TD 5,253 ft. 2 wells at year end.

FAYETTE—Jefferson, March; Humble Oil & Refining Co. 3 Mrs. A. M. Stewart, 27-9n-1w, Wilcox, 3,993-4,006 ft., 132 bbl. oil, TD 6,982 ft. 15 wells at year end.

KINGSTON—Adams, February; Magnolia Petroleum Co. 1 Tyer-Swayze unit B, 11-5n-2w, Wilcox, 6,605-09 ft., 312 bbl. oil, TD 6,732 ft. 7 wells at year end.

SIBLEY—Adams, December; B. Serio Drilling Co.-Gulmon & Johns 1 Ligon and Mazique, 50-5n-3w, Parker, 6,412-15 ft., 217 bbl. oil, TD 6,730 ft.

TINSLEY—Yazoo, December; Union Producing-Jones-O'Brien, 1 Logan, 23-10n-3w, Smackover, 13,985-14,427 ft., 68 bbl. oil, TD 14,427 ft.

TENNESSEE

NEW POOLS

KETTLE CREEK-PINE RIVER AREA—Clay, May; Callicott et al, 1 Davis, NE SE SW 20B-48E, oil, TD 494 ft.

COOKEVILLE AREA—Putnam, May; Will Wall 1 Fitzpatrick, NW 15-5s-49e, gas, TD 420 ft.

ALABAMA

NEW POOL

LANGSDALE—Choctaw, May; J. F. Crow Well Service Co. et al, 2 A. L. Pippin, 22-11n-5w, Eutaw "A," 3,794-3,812 ft., 186 bbl. oil, TD 3,918 ft.

OKLAHOMA

NEW POOLS

APACHE, SOUTH—Comanche, March; Tide Water Associated Oil Co. et al 1 Tah-wat-is-tah-ker-na-ker, SE SE SW 3-4n-11w, Simpson, 1,567-75 ft., 18 bbl. oil, TD 1,581 ft.

BEAVERS—Stephens, December; Peppers 1 Smith, NW SW SE 4-2n-8w, Hoxbar, 6,705-38 ft., 35 bbl. oil, TD 7,500 ft. 5 wells at year end.

BOLEY—Okfuskee, September; Wiser Oil Co. 1 Darby, NE SE NE 21-12n-8e, Cromwell, 3,724-27 ft., 19 bbl. oil, TD 3,788 ft.

BRANDLEY, NORTHEAST—Grady, September; Magnolia Petroleum Co. 1 Maurer, NW SE 21-5n-5w, Springer sands, 10,421-70 ft., 10,502-22 ft., and 10,536-54 ft., 16 bbl. dist., TD 11,336 ft.

BROOKSVILLE, EAST—Pottawatomie, November; Helmerich & Payne, Inc. 1 Cope, NE NE SW 2-8n-3e, dolomite, 5,070-96 ft., 5 bbl. oil, TD 5,096 ft.

BRYAN, NORTH—Pawnee, June; Ashland Oil & Refining Co. 1 Eye Bear, NW NW NW 35-21n-5e, Red Fork, 3,223-30 ft., 240 bbl. oil, TD 3,230 ft. 3 wells at year end.

BRYAN, NORTH—Pawnee, December; Josaline Production Co. 3 Eye Bear, SE SW NW 35-21n-5e, Red Fork, 3,223-30 ft., 240 bbl. oil, TD 3,230 ft. 3 wells at year end.

BURNETT—Pottawatomie, November; Sunray Oil Corp. 1 State, NW SE SE 16-8n-2e, Hunton, 5,210-40 ft. 132 bbl. oil, TD 6,089 ft.

CAMP, SOUTHEAST—Carter, October; Stanolind Oil & Gas Co. 1 Mills, SE NE SE 17-2s-3w, Tussy, 5,308-13 ft., 35 bbl. oil, TD 6,340 ft.

CARMEL—Jackson, August; Sun Oil Co. 1 Hulett-Robinson, SE SE NW 34-1e-22w, lime, 5,354-72 ft., 15 bbl. oil, TD 5,456 ft.

CARPENTER, SOUTHWEST—Beckham, October; United Carbon et al 1 Clark, C NE NW 32-12n-21w, Hoxbar conglomerate, 12,720-14,600 ft., 33 bbl. dist. TD 14,658 ft.

CAT TAIL SPRINGS—Pottawatomie, September; Brown & Smith 1 Walker, SW NE SW 18-17n-2e, second Wilcox, 6,134-49 ft., 217 bbl. oil, TD 6,149 ft.

CEMENT AREA—Caddo, March; Huffine et al 1 McKeune, 170 ft. NL and 1,630 ft. EL NE 24-5n-9w, 2,350-2,400, 2,409-23 ft., 3 bbl. oil, TD 2,430 ft.

CHICKASHA—Grady, December; Little Nick Oil Co. 4 Glover, NE NE NE 27-5n-8w, 8,963-90 ft., 20,000 M.c.f. gas, TD 15,638 ft. 2 wells at year end.

CHILOCCO, EAST—Kay, April; Dean Witter 1 Widener, SE NW NW 20-29n-3e, Bartlesville, 3,218-20 ft., 42 bbl. oil, TD 3,222 ft. 2 wells at year end.

COYLE, SOUTHEAST—Logan, August; Zephyr Drilling Co., Oklahoma Natural Gas Co. and T.G.&W.P. Railroad 1 Giddings, SE NE NW 21-17n-1e, second Wilcox, 5,070-80 ft., 296 bbl. oil, TD 5,080 ft.

CUSHING LAKE—Payne, February; T. W. & J. M. Loffland, Jr., 1 Stanolind Oil & Gas Co.-Amerada Petroleum Corp., NE SW SW 27-18n-4e, Simpson, 4,002-25 ft., 240 bbl. oil, TD 4,025 ft. 4 wells at year end.

CUSHING LAKE—Payne, December; Blackwell Oil & Gas Co. 1 Garrish, NE NE SE 20-18n-1e, 182 bbl. oil, Wilcox 5,205-38 ft., TD 5,238 ft.

DAVIS, NORTH—Murray, April; Hobson & Brown 1 Sadler, SW SW SE 20-1n-2e, limy sand, 1,863-1,978 ft., 24 bbl. oil, TD 2,110 ft.

DOE CREEK, NORTHWEST—Kay, April; Midstates Oil Corp. 1 Harris, NE NE NW 20-28n-2w, Simpson, 4,613-28 ft., 4,628-53 ft., 495 bbl. oil, TD 5,000 ft. 4 wells at year end.

DOGA, EAST—Osage, April; Republic Natural Gas Co. 1 Osage, 580 ft. NL and 990 ft. EL SW 9-24n-5e, Skinner, 2,950-54 ft. and 2,942-45 ft., 92 bbl. oil, TD 3,155 ft.

DRUM CREEK, NORTH—Osage, November; Oliphant 1 Osage, W/2 W/2 SE 4-25n-4e, Mississippi chat, 3,432-70 ft., 60 bbl. oil, TD 3,470 ft.

ELMDALE—Garfield, February; Roy Walton, Powell et al 1 Peters, SW SE SE 27-22n-4w, Belveal sand, 1,836-48 ft., 40 bbl. oil, TD 1,848 ft. OWDD.

ERING SPRINGS—Garvin, January; Superior Oil Co. 1 McDaniel, C NW SW 15-4n-4w, Gibson, 8,115-73, 70 bbl. oil, TD 8,203 ft.

ESSAQUANAHDALE, WEST—Cotton, April; Ted A. Norwood et al 1 Taylor, 165 ft. NL and 1,155 ft. WL NW 29-3s-11w, Pontotoc, 1,494-1,500 ft., 24 bbl. oil, TD 1,600 ft. 6 wells at year end.

FLAT ROCK, WEST—Osage, March; Geo. F. Martin 3 Osage, 1,660 ft SL and 330 ft. WL SE 35-21n-11e, Hominy, 2,045-51 ft., 11 bbl. oil, TD 2,055 ft.

GREEN VALLEY, NORTHWEST—Garfield, June; H. C. Bundy et al 1 J. N. Hodges, 355 ft. SL and 330 ft. WL NW 3-21n-3w, Crews sand, 2,172-82 ft. and 2,164-70 ft., 150 bbl. oil, TD 2,221 ft. 3 wells at year end.

HAPPY VALLEY, SOUTH—Lincoln, December; Johnson Oil & Refining Co., NW SW SE 35-17n-53, Bartlesville, 3,504-22 ft., 23 bbl. oil, TD 3,522 ft.

HENDERSON—Tillman, November; Sunray Oil Corp. 1 Cassidy, NE NE SE 1-3s-18w, Canyon, 3,018-28 ft., 8 bbl. oil, TD 5,542 ft.

HORNTOWN—Hughes, March; Helmerich & Payne, Inc., 1 Myers, SW SW NE 9-7n-10e, Cromwell, 3,567-79 ft., 750 M.c.f. gas, TD 4,922 ft.

JONES CHAPEL—Pontotoc, August; Jones & Shelburne et al 2 Wilson, SW NE SW 26-4n-5e, sand, 549-59 ft., 2,000 M.c.f. gas, TD 2,340 ft.

JONES CHAPEL—Pontotoc, December; S. C. Yingling 1 Floyd, NW NE NE 30-4n-5e, 17 bbl. oil, 1,545-70 ft., OWWO, PBTD 1,574 ft.

JOHNSONVILLE, WEST—McClain, May; Atlantic Refining Co. 1 Newbern, SE SE NW 22-5n-2e, basal Pennsylvanian lime, 4,290-4,302 ft., 3 bbl. oil, TD 5,785 ft.

KENDRICK, SOUTHEAST—Lincoln, September; Mid-Continent Petroleum Corp. 1 Rueb, SW SW NE 23-15n-5e, Prue sand, 3,325-42 ft., 1,190 M.c.f. gas, TD 4,294 ft.

LAWRIE, WEST—Logan, September; Davon Oil Corp. et al 1 Derr, NW NE NE 15-17n-3w, Layton, 4,646-74 ft., 188 bbl. oil, TD 4,700 ft.

LINDSAY TOWNSITE—Garvin, January; Pray et al 1 Miller, C NW SW 11-4n-4w, Osborne sand, 7,900-60 ft., 143 bbl. oil, TD 8,111 ft. 5 wells at year end.

LOVELL, NORTHWEST—Logan, March; Trigg Drilling Co. 1 Pollard, NE NE SE 6-18n-4w, Layton, 4,674-86 ft., 1,500 M.c.f. gas, 3 bbl. cond., TD 6,390 ft.

LUCIEN, EAST—Noble, April; Bay Petroleum Corp. 1 Jerome et al, SE SE SW 15-20n-2w, Perry gas sand, 3,178-30 ft., 25 bbl. oil, TD 5,237 ft. 5 wells at year end.

LUCIEN, EAST—Noble, November, T. N. Berry Co. 1 Nelson, NE NW NE 30-20n-1w, Perry, 3,438-40 ft., 7,300 M.c.f. gas, TD 4,395 ft.

MAMMOTH, NORTHEAST—Lincoln, August; The Texas Co. 1 Roberts, SW SW NW 34-13n-3e, Skinner sand, 4,542-49 ft., 55 bbl. oil, TD 4,944 ft. 7 wells at year end.

MANNSVILLE, SOUTHEAST—Marshall, December; The Texas Co. 1 F. A. Chapman, SW NW SE 35-4s-4e, Arbuckle, 2,260- 3,048 ft., 112 bbl. oil, TD 3,048 ft., PBTD 965 ft.

MARIETTA, EAST—Love, January; Walter H. Gant 1 Liddell, NE SW NE 13-7s-2e, sand, 5,498-5,516 ft., 108 bbl. oil, TD 6,835 ft.

MARSHALL, NORTHEAST—Logan, January; Schermerhorn Oil Corp. 1 Bridal, NE NE SE 5-19n-4w, lower Layton, 4,744-66 ft., 72 bbl. oil, TD 6,420 ft.

MAUD, EAST—Seminole, November; Miller 1 Wooldridge, SE NW SW 27-8n-5e, Simpson dolomite, 4,408-11 ft., 125 bbl. oil, TD 4,440 ft.

MAUD, WEST—Pottawatomie, October; An-Son Petroleum Co. et al 1 Truesdell, NE SE NW 31-8n-5e, Hunton, 4,025-86 ft., 30 bbl. oil, TD 4,380 ft.

MAYSFIELD, NORTHEAST—Beckham, June; Carter Oil Co. et al 1 Cora Garrett, SE SE SE 32-11n-25w, Hoxbar conglomerate, 10,271-295 ft., 153 bbl. oil, TD 11,100 ft.

McWILLIE, NORTH—Alfalfa, January;

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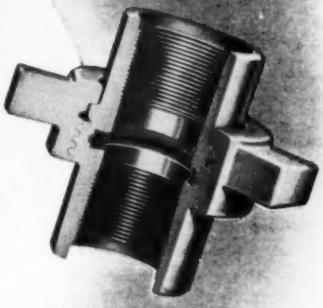

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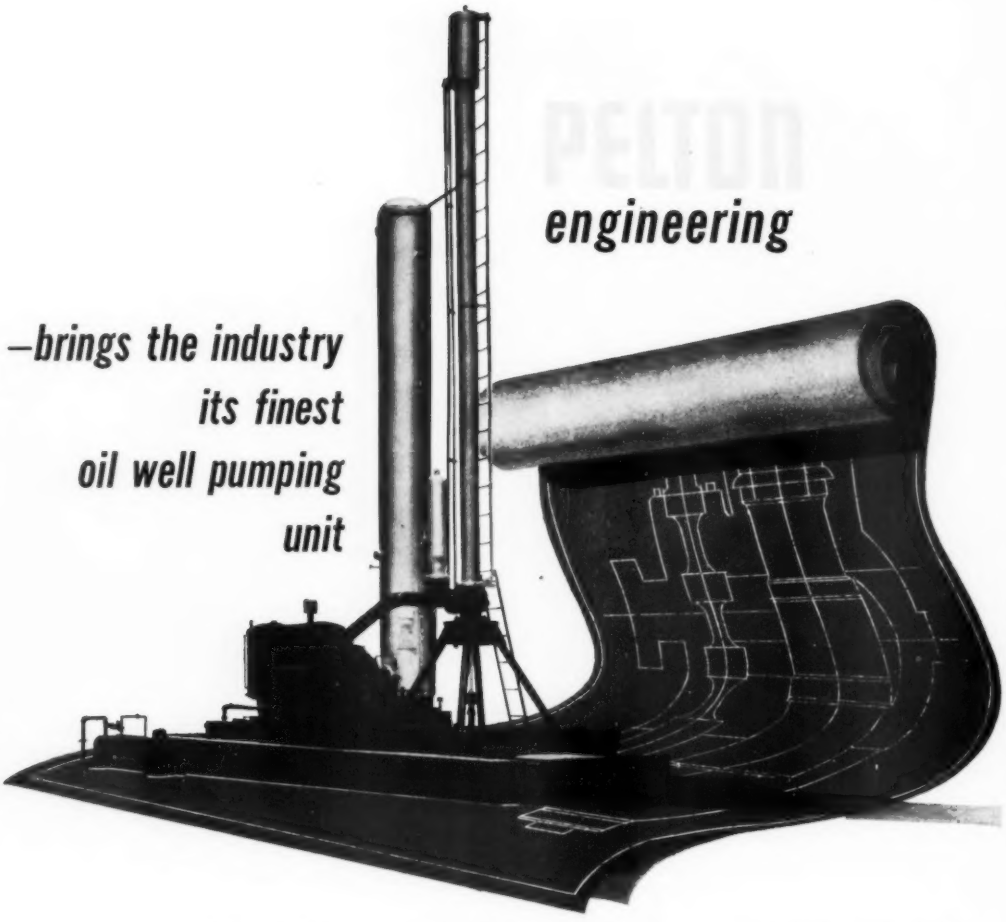

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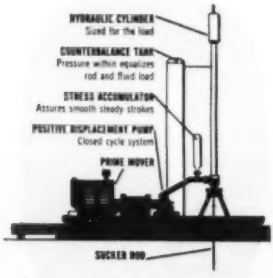

This outstanding heavy duty pumping unit with stroke lengths up to 30 ft. and polished rod loads up to 40,000 pounds produces more oil per day than any pumping means known.

Getting down to cases, a Pelton 30 ft. unit is pumping 925 B/D with a 2-1/4" bore pump set at 8100 ft. Previously, this same well, using a 108 in. Beam Pumper, produced only 400 B/D.

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Davis, Acre, Smiley, Little, Myers 1 Glidewell, 390 ft. from SL and 517 ft. from WL of NW¼ 14-24n-11w, Oswego, 5,860-5,930 ft., 6 bbl. oil, TD 5,935 ft.

MOUNT HOPE, NORTH—Payne, January; The Texas Co. 1 Real Pitts, SE SE NE 30-19n-4e, Skinner sand, 3,644-55 ft., 31 bbl. oil, TD 3,949 ft.

MT. HOPE, NORTH—Payne, December; Arthur Silberman 1 T. L. Lathrop, SW SW SE 11-17n-4e, Misener, 4,102-08 ft., 30 bbl. oil, TD 4,269 ft.

MT. HOPE, NORTH—Payne, January; The Texas Co. 1 Pitts, SE SE NE 30-19n-4e, Skinner, 3,552-62 ft., 31 bbl. oil, TD 3,949 ft. 3 wells at year end.

NEWCASTLE, EAST—McClain, June; Magnolia Petroleum Co. 1 Ben Arnold, C SW SE 13-9n-4w, Bois d'arc, 8,600-14 ft., 230 bbl. oil, TD 9,344 ft.

NOBLE, WEST (REVIVED)—McClain, July; Carter Oil Co. 2 Johnson, C SW SE 30-8n-2e, Oil Creek, 8,967-9,010 ft., 166 bbl. oil, TD 9,017 ft.

ORLANDO, NORTH—Noble, November; T. N. Berry Co. 1 Nelson, NE NW NE 30-20n-1w, Perry, 3,488-40 ft., 7,300 M.c.f. gas, TD 4,395 ft.

OSWALT, NORTHEAST—Love, December; Sinclair Oil & Gas Co. and Continental Oil Co. 1 Travis Sanders, NW SE NW 5-7s-1w, 65 bbl. oil, 7,211-33 ft. and 7,304-30 ft., TD 9,414 ft., PBTD 7,368 ft.

OSWALT, NORTHEAST—Love, December; Continental Oil Co. 1 Moxley, SW SW SW 10-6s-1w, 3,465 ft. 43 bbl. oil, TD 3,474 ft. 2 wells at year end.

OTOE CITY, NORTHWEST—Noble, February; Dirickson-Lewis Drilling Co. 1 Garrett, SW SW NE 8-22n-1e, Layton, 3,408-20 ft., 128 bbl. oil, TD 3,435 ft. 9 wells at year end.

PALACINE, NORTHWEST—Stephens, December; Sunray Oil Corp. 1 Hurst, NW NE SW 31-1s-6w, Arbuckle, 6,238 ft., 5 bbl. oil, TD 6,300 ft., PBTD 4,211 ft.

PARADISE—Payne, December; Blackwell Oil & Gas Co. 1 Garrish, NE NE SE 20-18n-18, Wilcox (first), 5,205-5,380 ft., 182 bbl. oil, TD 4,238 ft.

PAULS VALLEY, WEST—Garvin, January; Cities Service Oil Co. and Ohio Oil Co. 1 Hatcher, NW NW NE 28-4n-1w, second bromide, 4,674-82 ft., 261 bbl. oil, TD 4,740 ft. 8 wells at year end.

QUAY, SOUTHEAST—Payne, October; Evans 1 Cobble, SW NE NE 14-19n-6e, Simpson dolomite and Wilcox, 3,314-38 ft., 40 bbl. oil, TD 3,342 ft.

RICH VALLEY, SOUTHEAST—Grant, June; Sinclair Oil & Gas Co. 1 Hyder Mulkey, NW NW NE 7-25n-4w, second Wilcox, 5,816-20 ft., 412 M.c.f. gas, 536 bbl. oil, TD 5,820 ft. 7 wells at year end.

ROSENWALD, SOUTH—Okfuskee, February; Herndon Drilling Co. 1 Joe Smith, SW NE SE 26-13n-8e, Cromwell, 3,524-30 ft., 25 bbl. oil, TD 3,566 ft.

ROSS DAY, EAST—Osage, September; Sunray Oil Co. 1 Osage, NE NE NE 10-24n-4e, Mississippi chat, 3,374-84 ft., 18 bbl. oil, TD 3,908 ft.

ROSSVILLE, SOUTHWEST—Lincoln, October; Flynn Oil Co. 1 Wiley, SE SE NE 24-13n-2e, Skinner, 4,780-89 ft., 40 bbl. oil, TD 4,789 ft.

RUSK, SOUTH—Seminole, January; Birmingham-Bartlett Drilling Co. 1 Gragg "A," SW SE SE 13-11n-7e, Union Valley, 3,676-39 ft., first Cromwell, 3,679-82 ft., 33 bbl. oil, TD 3,751½ ft.

SANCHO, NORTH—Seminole, August; Flynn Oil Co. 1 Best, NW NE NE 32-9n-7e, Booch, 3,392-3,419 ft., 240 bbl oil, 3,419 ft. 3 wells at year end.

SCHLEGEL, NORTHWEST—Payne, August; Martgan 1 Manning, NE NE SW 20-18n-6e, Red Fork, 3,058-62 ft., 40 bbl. oil, TD 3,110 ft. 2 wells at year end.

SEALEY, NORTH—Seminole, February; Powell Briscoe, Inc., 1 Casey, NW SE SE 24-6n-7e, Gilcrease, 2,770-85 ft., 140 bbl. oil, TD 2,785 ft. 4 wells at year end.

SHAWNEE, EAST—Pottawatomie, February; Barrett & Musgrove 1 Guderian, SE NE NW 12-10n-4e, Wilcox, 4,837-65 ft., 365 bbl. oil, TD 4,865 ft. 5 wells at year end.

SHAWNEE LAKE, EAST—Pottawatomie, March; Arrow Drilling Co. 1 I. B. Farris, NW NE SE 24-10n-2w, Bartlesville sand,

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S c h l u m b e r g e r

5,096-5,116 ft., 32 bbl. oil, TD 5,855 ft. 2 wells at year end.

SHOLEM ALECHEM, SOUTHWEST— Carter, August; Stephens Petroleum Co. 1 Haas, NW SE NE 9-2s-3w, Humphrey sand, 6,410-18 and 6,432-51 ft., 259 bbl. oil, TD 7,225 ft. 2 wells at year end.

SPARKS, NORTHEAST—Lincoln, January; Mid-Continent Petroleum Corp. 1 School Land, SE SE SE 29-14n-5e, Bartlesville, 3,985-4,006 ft., 15 bbl. oil, TD 4,006 ft.

STROUD—Creek, August; Delta Petroleum Co. et al 1 Walker, SW NE NE 16-14n-7e, second Wilcox, 3,968-89 ft., 157 bbl. oil, TD 3,989 ft.

SUMNER, NORTHEAST—Noble, December; Randall R. Morton and D. & L. 1 Marshall, NE NE NE 26-22n-2e, Wilcox, 4,564-69 ft., 124 bbl. oil, TD 4,628 ft.

TERLTON, SOUTHEAST—Pawnee, September; Big Four Petroleum Co. 1 Sinclair, SW NW SW 34-20n-8e, Bartlesville, 2,495-2,505 ft., 11 bbl. oil, TD 2,505 ft. 3 wells at year end.

TROUSDALE — Pottawatomie, February; Buttram Petroleum Co. 1 School Land, SE SE NE 36-7n-2e, lower Calvin, 4,314-25 ft., 16 bbl. oil, TD 4,341 ft.

UNION VALLEY—Logan, April; Robert M. Jordan 1 Carvin, 585 ft. SL and 330 ft. WL NW 33-16n-1w, Simpson sand dolomite, 5,782-5,817 ft., 272 bbl. oil, TD 5,914 ft. 4 wells at year end.

UNNAMED—Pittsburg, March; Able Oil Co. 1 Dallas James, C NE NE 28-2n-15e, sand lime, 392-422 ft., 2 bbl. oil, TD 537 ft. 2 wells at year end.

VICTORY HILL, SOUTHWEST—Pottawatomie, September; Wood Oil Co. 1 Brant, SE NE SW 18-10n-5e, Simpson dolomite and first Wilcox, 4,760-80 ft., 25 bbl. oil, TD 4,780 ft., TD 4,802 ft.

WILCOX—Payne, March; Wilcox Oil Co. 1 Gould, NW NW NW 25-20n-4e, Skinner, 3,526-36 ft., 49 bbl. oil, TD 4,012 ft. 2 wells at year end.

YALE, EAST—Payne, December; Deep Rock Oil Corp. 1 Duncan, NE SW SE 4-19n-6e, lower Skinner, 3,030-39 ft., 16 bbl. oil, TD 3,601 ft.

YALE, SOUTHEAST — Payne, October; Massad 1 Delay, NE NW NW 26-19n-6e, Burgess, 3,340-46 ft., 26 bbl. oil, TD 3,490 ft.

NEW PAYS

ALLEN—Seminole, November; Osborn 1 Carpitchie, NE SE NE 11-5n-7e, Gilcrease, 2,530-50 ft., 25 bbl. oil, TD 4,427 ft.

APACHE, SOUTH—Comanche, April; Tide Water Associated Oil Co. et al 1 Myers, NE NE NW 10-4n-11w, detrital zone, 3,440-80 ft., 1,670 M.c.f. gas, TD 4,071 ft.

BELLMONT, WEST—Lincoln, April; Mid-Continent Petroleum Corp. 1 Bartodsj, SW NW SE 32-12n-5e, first Wilcox, 4,974-5,004 ft., 169 bbl. oil, TD 5,072 ft.

BLACKWELL, EAST — Kay, October; Prunty 1 Prunty, NW SE NW 28-27n-1e, Wilcox, 3,756-61 ft., 75 bbl. oil, TD 3,761 ft.

BRADLEY, NORTHEAST—Grady, June; Gulf 1 Mainka-Ring Unit, C SE NE 12-5n-5w, Chimneyhill, 12,120-160, 12,163-12,210 ft., 217 bbl. oil, TD 13,651 ft.

CARY—Okfuskee, December; Brimes 1-A Kennedy, NE NE NW 27-12n-10e, Misener, 23 bbl. oil, TD (?).

COFFEE CREEK — Oklahoma, October; Gulf Oil Corp. 3 Mayer, NW SW NE 15-14n-2w, Hunton, 5,780-5,858 ft., 6 bbl. oil, TD 6,282 ft.

COUNCIL HILL — Muskogee, February; W. H. Pine 2 Heckman-Fee, 200 ft NL and WL NW 17-13n-16e, Hunton, 2,598-2,608 ft., and 2,688-94 ft., 1,600 bbl. oil, TD 2,698 ft.

COUNCIL HILL — Muskogee, January; Robertson & Viersen 5 McKee, NE NE NE 18-13n-16e, Hunton, 2,586-96 ft., 15 bbl. oil, TD 2,689 ft.

DAVENPORT, WEST — Lincoln, May; Thompson & Harris 1 Gibbons Heirs, NW NE SW 17-14n-5e, Prue sand, 3,556-66 ft., 154 bbl. oil, TD 3,566 ft.

DAVENPORT, SOUTH — Lincoln, July; Keystone Oil Co. 1 Cox, SW SW SE 22-14n-5e, conglomerate, 2,746-55 ft., 66 bbl. oil, TD 2,755 ft.

FLAT ROCK—Osage, January; Hughes 1 Osage, SE SE SW 19-21n-12e, Tucker, 1,572-80 ft., 11 bbl. oil, TD 1,580 ft. OWWO.

FLETCHER, EAST—Osage, January; W. C. Jackson 2 Osage, 990 ft. from NL and from WL of SE¼ 5-22n-10e, Mississippian, 2,258-64 ft., 22 bbl. oil, TD 2,265 ft.

FORT SILL, NORTH—Comanche, July; Texola Drilling Co. 1 Brown, SE SW NW 24-4n-11w, Tulip Creek, 2,434-54 ft., and 2,458-69 ft., and McLish, 2,764-70 ft., 2,748-60 ft., and 2,669-75 ft., 15 bbl. oil, TD 3,003 ft.

GILCREASE, SOUTHWEST—Hughes, December; Davidor & Davidor 1 L. Rogers, SW SW NE 24-9n-8e, Misener, 3,999-4,008 ft., 60 bbl. oil, TD 4,008 ft.

FOX-GRAHAM—Carter, July; Schermerhorn Oil Corp. 3 McGill, NW SE SE 8-3s-2w, fusilinid sand, 2,487-2,500 ft., Tussy sand, 2,743-91 ft., and broken sand, 3,138-68 ft., 8 bbl. oil, TD 4,430 ft.

HEALDTON—Carter, January; Mid-States Oil Corp.-Wheeler-Ingraham 1 Austin et al, NW SW NE 32-3s-3w, limy sand and sand, 6,344-6,605 ft., 33 bbl. oil, TD 6,649 ft.

INGALLS—Payne, July; Republic Natural Gas Co. 3 Vogt, NW SW SW 22-19n-4e, Prue, 3,335-41 ft., 89 bbl. oil, TD 3,929 ft.

KNOX—Grady, January; Carter Oil Co. 4 Ray Horton, 125 ft. SW of C SW SE NW 8-3n-5w, Springer, 1,152-56 ft., 5,195-5,203 ft., 5,208-12 and 5,219-30 ft., 254 bbl. oil, TD 8,503 ft.

KNOX—Grady, March; Dick Webener 1 Todd, 330 ft SL and 960 ft. EL SE 1-3n-6w, 4,722-30 ft., 61 bbl. oil, TD 4,865 ft.

LAUDERDALE—Pawnee, January; L. B. Jackson 2 Van Eman, SE NW SE 23-20n-8e, Red Fork, 2,305-25 ft., 5 bbl. oil, TD 2,325 ft.

LAWRIE, WEST — Logan, December; Davon 1 Crawford, NW SE SE 10-17n-3w, first Wilcox, 6,073-80 ft., no gage dist., TD (?).

LUCIEN—Noble, January; Stanolind Oil & Gas Co. 5 Scholpp, SE SE SE 32-20n-2w, Simpson and Arbuckle, 4,835-5,014 ft., and 5,285-5,310 ft., 3 bbl. oil, TD 5,346 ft.

MARLOW, WEST—Stephens, July; The Texac Co. 1 Helm, SW SE NW 21-2n-8w, lower Sears sand, 6,685-6,700 ft., 265 bbl. oil, TD 6,733 ft. OWDD.

MAYSVILLE, SOUTHEAST—Garvin, October; Magnolia Petroleum Co. 1 Burns, NW SE NW 34-4n-2w, lower first Bromide sand, 6,249-6,334 ft., 122 bbl. oil, TD 6,334 ft., OWDD.

MILROY—Carter, May; Stanolind Oil & Gas Co. 1 Mattie Elmore, SW NW SW 18-2s-3w, Sycamore, 4,441-47, 4,460-66, 4,506-10, 4,530-36, 4,566-72, 4,575-78, and 4,582-90 ft., 60 bbl. oil, TD 4,797 ft.

MILROY—Stephens, July; Skelly Oil Co. 1 Jones, NE SW NE 23-2s-4w, 1,940-58 ft., 1,992-2,000 ft., 2,085-2,100 ft., 2,220-45 ft., 2,255-70 ft., and 2,730-60 ft., 219 bbl. oil, TD 6,196 ft.

MOORE—Cleveland, November; Sinclair Oil & Gas Co. 5 Franklin C-36, NE SE 21-10n-2w, McLish, 7,693-99 ft., 856 bbl. oil, TD 8,295 ft.

MOORE, SOUTH—Cleveland, November; Mid-Continent Petroleum Corp. 1 Westermier, NE SW SW 26-10n-3w, Oil Creek, 9,578-94 ft., 601 bbl. oil, TD 9,630 ft.

MOORE, WEST—Cleveland, June; Mid-Continent Petroleum Co. 3 Ed Harris, C NE SW 29-10n-3w, Joins, 9,452-69 ft., 92 bbl. oil, 3,000 M.c.f. gas, TD 9,703 ft.

NEW HOPE, SOUTHEAST—Garvin, February; Kerr-McGee Oil Industries, Inc., 1 Alba, C SE NW 11-4n-3w, Viola, 7,530-70 ft., 85 bbl. oil, TD 8,007 ft.

NORMAN, NORTHWEST—Cleveland, July; Producers Development Co. 1 White, C SE NE 20-9n-3w, Tulip Creek, 9,712-36 ft., 180 bbl. oil, TD 10,235 ft. OWDD.

NORFOLK, WEST — Payne, January; Woods Drilling Co. 2 Hill, NE SW NW 8-18n-5e, conglomerate, 2,553-57 ft., 49 bbl. oil, TD 2,823 ft.

OLIVE—Creek, April; H. V. Pickett and J. E. Chiles 1 Beaver, NW NE NE 12-17n-8e, Skinner, 2,338-60 ft., 2,500 M.c.f. gas, TD 2,380 ft.

PAULS VALLEY, WEST—Garvin, April; Gene Goff 1 Bailey, SE SE NE 20-4n-1w, basal Pennsylvanian detrital limestone, 4,645-4,662 ft., 130 bbl. oil, TD 5,001 ft.

POOR FARM, SOUTHEAST—Creek, June; Jones-Shelburne, Inc., 1 Bishop, SW SE NW 12-15n-8e, second Wilcox, 3,693-3,709 ft., 42 bbl. oil, TD 3,709 ft.

RED BANK—Creek, May; Earl E. Barnes 1 Fenton, NE SW SW 9-16n-8e, third Bartlesville sand, 2,860-73 ft., 23 bbl. oil, TD 2,873 ft.

SAMS, NORTHEAST — Noble, November; Bay Petroleum Co. 1 Bolzinger, NW NW NW 18-21n-1w, Avant, 3,374-94 ft., 60 bbl. oil, TD 5,098 ft.

SHOLEM ALECHEM — Carter, January; Magnolia Petroleum Co. et al 7 Bumpass, NW SE 33-1s-3w, Simpson, 5,224-5,522 ft., 6,500 M.c.f. gas, TD 10,900 ft.

SHOLEM ALECHEM — Carter, August; Stanolind Oil & Gas Co. and Amerada Petroleum Corp. 1 Johnson, SE NW NE 4-2s-3w, sand, 6,416-20 ft., 6,392-96 ft., 5,704-10 ft., and 5,718-24 ft., 57 bbl. oil, TD 6,801 ft.

SHOLEM ALECHEM, SOUTHWEST—Carter, October; Stanolind Oil & Gas Co. 1 McDaniel, SE NE NE 9-2s-3w, Springer "B" sand, 6,222-26 and 6,242-50 ft., 238 bbl. oil, TD 7,600 ft.

SPARKS, EAST — Lincoln, September; Delaney Drilling Co. 1 State, NW SW SW 16-13n-5e, Hunton, 4,762-82 ft., 164 bbl. oil, TD 4,782 ft.

STARR VALLEY—Payne, March; Amerada Petroleum Corp. 1 Grace White, NW NW SE 4-19n-3e, Red Fork, 3,991-95 ft., 11 bbl. oil, TD 3,995 ft.

STOCKTON—Love, August; Sinclair Oil & Gas Co. 2 Peabody, NW SW SE 26-6s-2w, sand 6,497-6,518 ft., 120 bbl. oil, TD 10,388 ft.

STROUD—Lincoln, May; A. R. McElreath and Ned Biffle 1 Hugh Robertson Est., SE NW SW 3-14n-6e, Simpson, 3,933-34 ft., 1,200 bbl. oil, TD 3,934 ft.

STROUD—Lincoln, June; A. R. McElreath, Biffle, and Harvey 2 Robertson Est., 450 ft. NL and 330 ft. WL SW 3-14n-6e, Hunton, 3,982-4,012 ft., 372 bbl. oil, TD 4,220 ft.

STROUD—Lincoln, July; Hubbell & Webb 1 Hill, NW NW NW 10-14n-6e, second Wilcox, 3,806-36 ft., and Tyner, 3,848-69 ft., 576 bbl. oil, TD 3,943 ft.

TATUMS—Carter, November; Kirkpatrick 5 Epley, SE SW NW 9-1s-3w, Springer, 120 bbl. oil, TD 5,800 ft.

TRANSCONTINENTAL—Muskogee, March; Ozan Oil Co. and H. L. Swindler 2 Lizize Jackson, 780 ft. SL and 760 ft. WL SW 8-13n-16e, lime, 1,730-37 ft., 35 bbl. oil, TD 1,781 ft.

UNION VALLEY — Logan, September; R. M. Jordan 1 Yates, E/2 SW SW 29-16n-1w, Red Fork, 5,314-36 ft., 35 bbl. oil, TD 5,869 ft.

VALLEY GROVE, SOUTHEAST—Okfuskee, November; Skelly Oil Co. 1 Tiger, SW SE NW 12-12n-8e, Gilcrease, 3,304-10 ft., 127 bbl. oil, TD 4,107 ft. OWWO.

VELMA, SOUTH—Stephens, June; Van Grisso-Kerr-McGee Oil Industries, Inc., 2 Killingsworth, SW SW NE 13-2s-5w, Dornick Hills sand, 2,348-54 ft., and 2,362-70 ft., 120 bbl. oil, TD 2,751 ft.

VELMA—Stephens, July; Skelly Oil Co. 32 W. Franklin, NE SE SE 34-1s-5w, Springer, 3,740-46 ft., 3,753-67 ft., 3,767-77 ft., 147 bbl. oil, TD 3,842 ft.

VELMA—Stephens, October; Skelly Oil Co. 1 Robberson "A," SW NE SE 34-1s-5w, Springer, 4,420-30 ft., 57 bbl. oil, TD 5,300 ft.

WETUMKA, SOUTH—Hughes, January; E.L.M. Drilling Co. et al 5 McCoy, NE NW NE 33-9n-10e, lower Cromwell, 3,155-60½ ft., 7,331 M.c.f. gas, TD 3,750 ft.

WETUMKA, SOUTH — Hughes, April; Davidor & Davidor 5 E. S. Osborne, NE SW NE 33-9n-10e, Misener-Hunton, 3,728-39 ft., 72.58 bbl. oil, 3,970 M.c.f. gas, TD 3,739 ft.

YALE-QUAY—Payne, January; Mid-Continent Petroleum Corp. 1 Minnick, NW NW NW 19-19n-6e, conglomerate, 2,602-18 ft., 20 bbl. oil, TD 3,087 ft.

YALE-QUAY—Payne, November; Sinclair Oil & Gas Co. 30 Crockett, SW NE SE 13-19n-5e, Peru, 2,733-45 ft., 12 bbl. oil, TD 3,595 ft.

KANSAS

NEW POOLS

AMEH—Barton, April; Sohio Petroleum Co. 1 Schrepel, NE NW SW 19-18s-11w, Lansing, 3,103-08 ft., 343 bbl. oil, TD 3,486 ft. 2 wells at year end.

ANNON—Rooks, July; Derby Oil Co.-Champlin Oil Co. 1 Annon, SW SW NE 27-10s-20w, Arbuckle, 3,711-17 ft., 331 bbl., TD 3,717 ft.

ARTZ—Phillips, January; Marmad Oil Co. 1 Artz, SE NW NE 19-1s-18w, Lansing, 3,456-58 ft., 24 bbl. oil, TD 3,510 ft.

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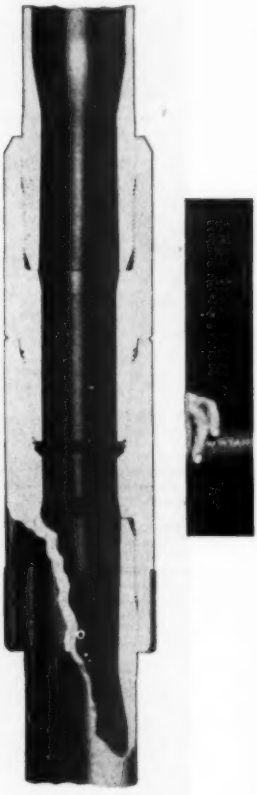

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ASHLAND—Clark, March; Stanolind Oil & Gas Co. 1 Daisy Wall, C NE SE 35-32s-23w, Viola, 6,526-36 ft., 6,560-86 ft., 129 bbl. oil, TD 6,859 ft. 2 wells at year end.

BACHOFER—Saline, September; Harper 2 Bachofer, CSL NE NE 15-15s-2w, Mississippi chat, 2,799-2,805 ft., 20 bbl. oil, TD 2,805 ft. 3 wells at year end.

BASSETT — Rooks, March; Heathman Drilling Co. 1 Bassett, SW SW SE 20-10s-20w, Arbuckle, 3,753-59 ft., 3,759-62½ ft., and 3,762½-67½ ft., 124 bbl. oil, TD 3,768½ ft.

BAYER—Stafford, July; Petroleum, Inc., 1 Bayer, SE SE SE 16-21s-14w, Lansing, 3,558-66 ft., 183 bbl. oil, TD 3,762 ft.

BECKMAN—Phillips, November; Cooperative Refining Co. et al 1 Beckman "A," SW SW SE 3-4s-19w, Lansing-Kansas City, 3,201-03 ft., 3,206-08 ft., 3,220-22 ft., and 3,243-47 ft., 22 bbl. oil. TD 3,528 ft.

BERNARD—Barton, February; C. E. Ash and L. B. Smith 1 Musenberg "B," SE SE NW 10-19s-11w, Lansing-Kansas City, 3,053-3,337 ft., 396 bbl. oil, TD 3,367 ft. 10 wells at year end.

BYRON, SOUTHEAST—Stafford, July; Duke & Wood Drilling Co. 1 Christianson, NW SW NW 10-21s-12w, Arbuckle, 3,503-06 ft., 42 bbl. oil, TD 3,506 ft. 2 wells at year end.

COAL CREEK—Russell, August; Alpine Oil & Refining Co. 1 Daniels, NW NW SW 22-15s-11w, conglomerate, 3,178-88 ft., 25 bbl. oil, TD 3,188 ft. 2 wells at year end.

COCKLIN—Stafford, October; Anderson-Prichard Oil Corp. 1 Cocklin, SW SW SW 19-22s-11w, Arbuckle, 3,659-60 ft., 210 bbl. oil, TD 3,660 ft.

CROCKER—Graham, August; Jones-Shelburne, Inc., and Farmer 1 Teall, SE SE NW 18-10s-21w, Arbuckle, 3,913-23 ft., 232 bbl. oil, TD 3,923 ft.

DAMME—Finney, June; W. L. Hartman 1 Damme, SE SE NW 21-22s-33w, Mississippian, 4,711-19 ft., 1,795 bbl. oil, TD 4,785 ft. 2 wells at year end.

DARTMOUTH, NORTHWEST—Barton, August; B. & R. et al 1 Johnson "B," SW SE NW 28-19s-12w, Lansing-Kansas City, 3,305-10 ft., 297 bbl. oil, TD 3,403 ft.

DELL, EAST—Stafford, July; Petroleum, Inc., 1 Newcomb, SW SW SW 5-21s-13w, Lansing, 3,471-83 ft., 560 bbl. oil, TD 3,652 ft. 3 wells at year end.

DELL, NORTHEAST—Stafford, December; Petroleum, Inc., 1 Newcomb "B," SE SE NW 5-21s-13w, 3,612-15 ft., 75 bbl. oil, TD 3,629 ft.

DEWEY—Kingman, January; Pabco Drilling Co. 1 Viney "B," SW SW SW 9-28s-5w, Mississippian, 3,805-11 ft., 121 bbl. oil, TD 3,849 ft. 10 wells at year end.

DRESDEN—Kingman, June; Linn Oil Co. 2 McMichael, SE SE SW 13-27s-10w, Viola 4,270-78 ft., 432 bbl. oil, TD 4,470 ft. 19 wells at year end.

DRY CREEK—Phillips, March; Honaker Drilling Co. 1 Gebhart, NW NE NW 7-1s-18w, Lansing-Kansas City, 3,408-12 ft., 6 bbl. oil, TD 3,449 ft.

DUGGAN—Stafford, January; Hexagon Oil Co. 1 Duggan, NE SW SW 30-21s-11w, conglomerate, 3,479-85 ft., and 3,489-95 ft., 470 bbl. oil, TD 3,578 ft. 9 wells at year end.

EDGECOMB—Butler, September; Eckland Drilling Co. 1 Neiman, SW NW SE 9-25s-3e, Mississippian, 2,759-60 ft., 25 bbl. oil, TD 2,760 ft.

EDWARDS, NORTH—Ellsworth, January; Continental Oil Co. 1 Shumway, SW SW NW 10-17s-8w, Simpson, 3,158-67 ft., 275 bbl. oil, TD 3,167 ft.

EDWARDS, NORTH—Ellsworth, March; Westgate-Greenland 1 Kaska, NW NW NW 15-17s-8w, Arbuckle, 3,172-76 ft., 664 bbl. oil, TD 3,176 ft. 35 wells at year end.

ERHLICH—Russell, August; Shumaker-Meyers 1 Erhlich, NW NW SE 7-14s-13w, Tarkio, 2,383-93 ft., 12 bbl. oil, TD 2,410 ft.

ELM CREEK—Rooks, October; Sidey 1 Stamper, SW SW NE 19-8s-17w, Arbuckle, 3,400-02 ft., 277 bbl. oil, TD 3,402 ft.

ERIC—Stafford, July; Omega Oil Co. 1 Fisher, CEL NW NE 8-21s-13w, Lansing, 3,513-15 ft., 25 bbl. oil, TD 3,625 ft. OWWO.

EULERT, NORTH—Ellis, October; GMR Oil Co. 1 Staab, SW SW SW 31-12s-17w, Arbuckle, 3,600-15 ft., 232 bbl. oil, TD 3,615 ft.

EVAN MOUND—Kingman, August; Bankoff Oil Co. 1 Dieffanbacher, SW SW SW 22-27s-5w, Mississippian, 3,802-19 ft., 28 bbl. oil, TD 3,819 ft.

EVERS—Pawnee, February; Stanolind Oil & Gas Co. 1 J. Evers, NE NW NE 1-22s-16w, Lansing-Kansas City, 3,488-3,795 ft., 58 bbl. oil, TD 3,972 ft.

FAIRVIEW, SOUTH—Sedgwick, January; Gaty 1 Tjaden, NE SW NE 17-26s-2e, Burgess, 2,945-50 ft., 32 bbl. oil, TD 2,950 ft.

FARGO, WEST — Graham, December; Yockey Oil Co., Inc., 2 Walker, NW SE NW 34-9s-22w, Lansing, 3,155-85 ft., 50 bbl. oil, TD 3,807 ft.

FOUR MILE CREEK—Butler, February; Gaty 1 Graham, SW SE NE 5-28s-3e, Simpson, 3,070-72 ft., 2,068 bbl. oil, TD 3,072 ft. 4 wells at year end.

FT. ZARAH, SOUTHEAST—Barton, May; G.M.R. Oil Co. 1 Stark, NE NE NW 32-19s-12w, Arbuckle, 3,385-88 ft., 168 bbl. oil, TD 3,388 ft. 4 wells at year end.

FT. ZARAH—Barton, January; National Associated Petroleum Co. 1 Harris, NE NE SW 30-19s-12w, Arbuckle, 3,394-3,400 ft., 150 bbl. oil, TD 3,400 ft.

FT. ZARAH, NORTH—Barton, September; Alpine Oil & Royalty Co. 1 McIlrath, NE NE NW 19-19s-12w, Lansing, 3,208-14 ft., 346 bbl. oil, TD 3,430 ft.

GERMAN VALLEY — Stafford, August; Anschutz Drilling Co. 1 Sittner, SE NE SW 4-22s-12w, Arbuckle, 3,648-52 ft., 303 bbl. oil, TD 3,652 ft.

GLENWOOD—Phillips, March; Westgate-Greenland Oil Co. and Bay Petroleum Co. 1 Rolland, SW SW SW 21-1s-17w, Lansing-Kansas City, 3,597-3,618 ft., 83 bbl. oil, TD 3,758 ft.

GOVE—Gove, December; Musgrove Petroleum Co. 1 Teeter, NE NE SE 26-13s-30w, Mississippian, 4,547-50 ft., 374 bbl. oil, TD 4,725 ft.

GROUSE CREEK—Cowley, August; Wiedeman 1 Lee, NW NE SW 16-30s-7e, Mississippi lime, 2,890-2,917 ft., 15 bbl. oil, TD 2,917 ft.

GUELPH — Sumner, August; Herndon Drilling Co. 1 Gurley, NE SW NE 6-35s-1e, Stalnaker, 3,028-73 ft., 87 bbl. oil, TD 3,073 ft. 4 wells at year end.

HARMONY—Graham, November; Murfin Drilling Co. 1 Morris, SE SE SE 32-7s-22w, Lanscing, 3,597-3,600 ft., 1,068 bbl. oil, TD 3,772 ft.

HARRISON—Barton, December; Grant 1 Harrison, NW/3 18-20s-13w, Arbuckle, 125 bbl. oil, TD 3,559 ft. 2 wells at year end.

HERL—Ellis, July; Lion Oil Co. 1 Herl, NW NW SE 28-14s-17w, Arbuckle, 3,476-88 ft., 133 bbl. oil, TD 3,488 ft. 4 wells at year end.

HICKMAN—Stafford, March; M. B. Armer 1 Gates "B," SE SE SW 27-21s-14w, Lansing-Kansas City, 3,522-32 ft., 2,457 bbl. oil, TD 3,787 ft. 13 wells at year end.

HIGHLAND—Graham, January; Deep Rock Oil Corp. 1 Moore, SE SE SE 20-8s-22w, Lansing-Kansas City, 3,441-3,813 ft., 209 bbl. oil, TD 3,895 ft.

HISS, SOUTH—Barton, January; Petroleum, Inc., 1 Benjamin, NE SE SW 31-20s-13w, Arbuckle, 3,542-43 ft., 395 bbl. oil, TD 3,592 ft. 2 wells at year end.

HOLM—Saline, August; Musgrove and Bay Petroleum Co. 1 Holm, NW NW NW 32-16s-3w. Maquoketa dolomite, 3,406-12 ft., 227 bbl. oil, TD 3,636 ft. 2 wells at year end.

HUFFSTUTTER, SOUTHWEST—Phillips, August; Lewis Drilling Co. 1 Kelly, NE NE SE 23-2s-19w, Lansing-Kansas City, 3,458-62 ft., 163 bbl. oil, TD 3,568 ft.

HUFFSTUTTER, NORTHEAST — Phillips, April; B. & R. Drilling Co. 2 Babcock, NW NE NW 21-1s-18w, Lansing-Kansas City, 3,345-49 ft., 3,357-63 ft., 3,311-18 ft., and 3,340-44 ft., 2 bbl. oil, TD 3,440 ft.

JASPER — Gove, November; Herndon Drilling Co. et al 1 Jasper, NE NE NE 30-15s-29w, Lansing, 3,670-73 ft., 41 bbl. oil, TD 4,324 ft.

JENNINGS—Decatur, September; The Texas Co. 1 Keenan, NW NW SE 25-4s-27w, Lansing-Kansas City, 3,478-82 ft., 162 bbl. oil, TD 3,925 ft. 2 wells at year end.

KARLIN—Ellis, May; Sterling Drilling Co. et al Karlin, NW SW NE, Lansing, 3,348-52 ft., 77 bbl. oil, TD 3,568 ft. 5 wells at year end.

KENT—Phillips, March; Hanaker Drilling Co. 1 Kent, NE SE SE 22-1s-18w, Lansing-Kansas City, 3,432-36, 3,446-50, 3,484-92, 3,504-3,505 ft., 20 bbl. oil, TD 3,505 ft.

KEYSTONE — Scott, January; Herndon Drilling Co. 1 Rueter, NE NE NE 25-18s-32w, Lansing, 4,002-08 ft., 143 bbl. oil, TD 4,646 ft. 3 wells at year end.

KNEELAND—Seward, October; Columbian Fuel Corp. and United Carbon Co. 1 Kneeland, C NE NE 23-34s-31w, Marmaton, 5,332-62 ft., 12 bbl. oil, TD 6,300 ft.

KRUSE—Rooks, January; Broadview Oil Co. 1 Becker, SE NW SE 34-9s-16w, lime, 3,094-3,118 ft., 10 bbl. oil, TD 3,131 ft. 2 wells at year end.

KUSKE, NORTH—Sedgwick, June; C. L. Carlock 1 Stagg, SE SE NE 13-25s-1e, Burgess sand, 3,016½-17 ft., 132 bbl. oil, TD 3,017 ft.

LANDSDOWN, NORTH—Kingman, February; Laura Jane Oil Co. 1 Seward, SE SE SE 4-28s-5w, Mississippian, 3,814-17 ft., 148 bbl. oil, TD 3,817 ft.

LARKIN—Barton, April; Anschutz Drilling Co. 1 Riedal, C E/2 E/2 E/2 10-17s-14w, Lansing-Kansas City, 3,277-82 ft., 873 bbl. oil, TD 3,480 ft. 5 wells at year end.

LAW, SOUTH—Graham, April; Gore et al 1 Law, NE NE SE 34-9s-23w, Lansing-Kansas City, 3,922-32 ft., 534 bbl. oil, TD 4,218 ft.

LAW, SOUTH—Graham, September; Gore 1 Law, NW NW SW 2-10s-23w, Marmaton, 4,126-42 ft., 77 bbl. oil, TD 4,268 ft. 2 wells at year end.

LEE—Sumner, April; Berry and Ella 1 Lee, SE SE NE 33-32s-2e, Mississippi chert, 3,350½-58½ ft., 25 bbl. oil, TD 3,358½ ft. 3 wells at year end.

LINCOLN—Stafford, May; Petroleum, Inc., 1 Lincoln, NW SE SE 29-21s-14w, Kansas City, 3,543-51 ft., 1,674 bbl. oil, TD 3,849 ft. 3 wells at year end.

LOCUST GROVE, SOUTHEAST—Rooks, June; Francis Oil & Gas Co. 1 Anderson, SW SW SW 9-7s-19w, Arbuckle, 3,400-03 ft., 28 bbl. oil, TD 3,409 ft.

LUENING—Sedgwick, August; Lion Oil Co. 1 Luening, CSL NW SE 33-26s-2e, Simpson, 3,338-42 ft., 25 bbl. oil, TD 3,372 ft.

LYND—Rooks, May; Jones-Shelburne, Inc., and Farmer 1 Lynd, SE SE SE 32-9s-19w, Arbuckle, 3,750-57 ft., 79 bbl. oil, TD 3,758 ft. 7 wells at year end.

MARCOTTE, SOUTH—Rooks, May; Derby Oil Co. et al 1 Rogers "A," SW SW SW 22-10s-20w, Arbuckle, 3,720-26 ft., 199 bbl. oil, TD 3,726 ft. 2 wells at year end.

MARIE — Stafford, January; Anschutz Drilling Co. 1 Fischer, SW SE SW 30-21s-12w, Arbuckle, 3,637-44 ft., 686 bbl. oil, TD 3,643 ft. 3 wells at year end.

McKINNEY—Meade, January; Skelly Oil Co. 1 McKinney "B," SW SW NE 35-33s-26w, 5,633-5,708 ft., 9,900 M.f. gas, TD 6,064 ft. 3 wells at year end.

METZ—Sumner, January; Texas-Pacific Coal & Oil Co. 1 Metz, NE NE NW 7-32s-2e, Arbuckle, 3,773-77 ft., 147 bbl. oil, TD 3,777 ft. 2 wells at year end.

MILLBROOK—Graham, November; Peel-Hardman 1 Legere, NW NW SE 21-8s-23w, Lansing, 3,761-67 ft., and 3,781-89 ft., 306 bbl. oil, TD 4,080 ft.

MINNEHA—Sedgwick, May; A. D. Allison et al, 1 Faulk, SE SW SE 11-27s-2e, Arbuckle, 3,247-51 ft., 144 bbl. oil, TD 3,288 ft.

MINNEHA, NORTHWEST — Sedgwick, June; A. D. Allison & Co. 1 Stoltz, NE NE NE 10-27-2e, Arbuckle, 3,300-02, 3,308-09 ft., 112 bbl. oil, TD 3,316 ft.

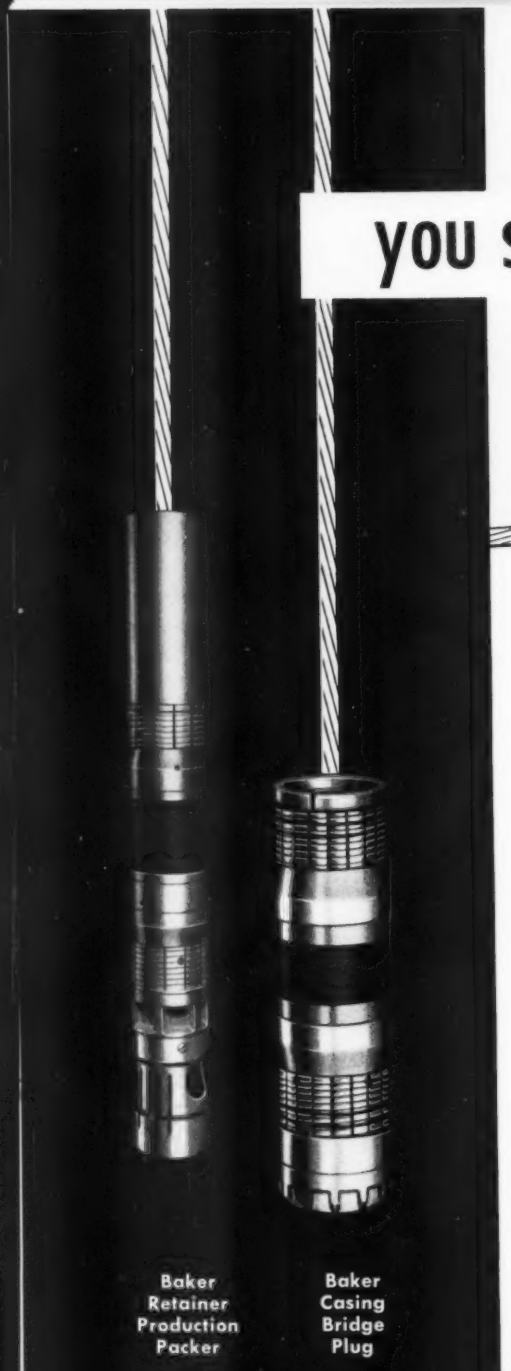
MORTON, SOUTHEAST—Reno, August; Cities Service Oil Co. 1 Birket, SW SW SW 16-24s-8w, Lansing, 3,423-35 ft., 3,481-91 ft., and 3,501-07 ft., 39 bbl. oil, TD 3,785 ft.

MUELLER, NORTHWEST—Stafford, August; Murfin Drilling Co. 1 Batman, CSL S/2 SE 12-21s-13w, Arbuckle, 3-523-31 ft., 290 bbl. oil, TD 3,531 ft. 2 wells at year end.

NOVINGER — Meade, May; Columbian Fuel Corp. and United Carbon Co. 1 Novinger, C NW NW 26-33s-30w, Marmaton, 5,270-90 ft., 1,675 bbl oil, TD 6,637 ft. 2 wells at year end.

OGALLAH—Trego, May; Pyramid Drilling Co. et al. Schoenthaler, SE SW SE 26-12s-22w, Arbuckle, 3,966-90 ft., 1,397 bbl. oil, TD 3,990 ft. 16 wells at year end.

OGALLAH, WEST — Trego, September; Stanolind Oil & Gas Co. 1-A Anderson, NE NE SE 28-12s-22w, Arbuckle dolomite,



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perforating operation and the wire line setting of a Baker Bridge Plug, or a Baker Production Packer can be performed from a *single set-up* by the wire line service organization you select, with definite *savings in time and money.*

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(a) wire line measurement while logging the well;

(b) wire line measurement for gun perforating; followed by

(c) wire line measurement for setting Baker Bridge Plugs or Baker Retainer Production Packers.

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4,037-81 ft., 77 bbl. oil, TD 4,085 ft. 5 wells at year end.

OGALLAH, SOUTHEAST—Trego, August; Stanolind Oil & Gas Co. 1 Monroe, SE NW SE 36-12s-22w, Arbuckle, 3,962-76 ft., 83 bbl. oil, TD 3,983 ft.

OSCAR, NORTH—Stafford, July; Armer 1 McBride, SE NE SE 14-22s-14w, Arbuckle, 3,780-84 ft., 884 bbl. oil, TD 3,784 ft. 2 wells at year end.

PALCO, SOUTHWEST—Rooks, October; Brooks Hall 1 Holmes, SE SE NW 7-10s-20w, Arbuckle, 3,859-61 ft., 464 bbl. oil, TD 3,861 ft. 3 wells at year end.

PIERCE, WEST—Butler, March; Rex-Morris Drilling Co. and Adair 1 Sparks, SW NE SE 20-25s-4e, Mississippian chert, 2,510-39 ft., 25 bbl. oil, TD 2,960 ft.

PLEASANT RIDGE, SOUTHWEST—Ellis, September; Isern Brothers 1 Krannawitter, SE SW NW 19-12s-17w, Arbuckle, 3,675-88 ft., 129 bbl. oil, TD 3,688 ft.

PURDEYVILLE—Hodgeman, April; I. W. Siegel 1 Schraeder, NW SE NW 3-24s-24w, Mississippian dolomite, 4,665-83 ft., 1,549 bbl. oil, TD 4,683 ft. 5 wells at year end.

PUTNAM—Barton, December; Rocket Oil & Gas Co. 1 Putnam, NW NW NW 7-17s-13w, Lansing-Kansas City, 3,286-93 ft., 212 bbl. oil, TD 3,489 ft.

RICHARDSON—Stafford, March; Deardorf Oil Co. 1 Spangenberg, SE SW NE 29-22s-11w, Lansing, 3,290-3,300 ft., 3,264-72 ft., 185 bbl. oil, TD 3,613 ft. 4 wells at year end.

RIFFE—Rooks, August; Sohio Petroleum Co. 1 Riffe, SE SE SW 4-7s-19w, Lansing-Kansas City, 3,223-3,307 ft., 119 bbl. oil, TD 3,537 ft. 3 wells at year end.

RYDING—Saline, May; T. A. Phillips and Sanderson 1 Ryding, NW NW NW 1-16s-4w, Maquoketa, 3,439-43 ft., 508 bbl. oil, TD 3,443 ft.

RYDING—Saline, July; El Dorado Refining Co. 1 Olsson, NW NW SW 1-16s-4w, Maquoketa dolomite, 3,422-27 ft., 528 bbl. oil, TD 3,427 ft. 13 wells at year end.

SALINA — Saline, July; Northwestern Drillers 1 Faith, CSL N/2 NW 19-14s-2w, Viola, 3,206-09 ft., 40 bbl. oil, TD 3,209 ft. 3 wells at year end.

SANDROCK—Barton, May; Atkins Drilling, Inc., 1 Sandrock, SW SW SE 21-20s-13w, Lansing, 3,412-20 ft., 42 bbl. oil, TD 3,590 ft.

SANDFORD—Barton, July; Todd Drilling Co. 1 Sandford, SW NW NW 25-17s-14w, Arbuckle, 3,375-94 ft., 453 bbl. oil, TD 3,394 ft. 3 wells at year end.

SANKEY—Reno, August; Atlantic Refining Co. 1 Sankey, NW NW NW 22-22s-10w, Lansing-Kansas City, 3,187-95 ft., 502 bbl. oil, TD 3,672 ft.

SHEPPARD—Stafford, February; El Dorado Refining Co. 1 Sheppard, SE SE NW 16-22s-11w, Arbuckle, 3,548-83 ft., 58 bbl. oil, TD 3,582 ft. 5 wells at year end.

SHILOM—Graham, December; I. Siegel-Prime Drilling Co. 1 Minium, SW SW NW 1-9s-25w, 4,013-17 ft., 1,070 bbl. oil, TD 4,058 ft.

SHOO FLY—Barton, July; Petroleum, Inc., 1 Johnson, SE SE NW 9-17s-13w, Kansas City, 3,170-74 ft., 401 bbl. oil, TD 3,388 ft. 3 wells at year end.

SLEEPER—Stafford, March; Lewis Drilling Co. 1 Sleeper, SW SW SE 22-22s-11w, conglomerate, 3,581-90 ft., 683 bbl. oil, TD 3,590 ft.

SLINKER—Phillips, July; Rine Drilling Co. 1 Slinker, SW SW SE 25-4s-20w, Lansing-Kansas City, 3,215-23 ft., 118 bbl. oil, TD 3,500 ft. 3 wells at year end.

SMALLWOOD—Stafford, August; Westgate-Greenland Oil Co. 1 Wetig, NW NW SE 2-22s-14w, Lansing-Kansas City, 3,474-94 ft., and 3,532-43 ft., 677 bbl. oil, TD 3,810 ft. 9 wells at year end.

SMITH-DENNING, WEST—Graham, September; Deep Rock Oil Corp. 1 Beecher, NW NW NE 6-10s-21w, Arbluckle, 3,881½-82½, 195 bbl. oil, TD 3,882½ ft.

SOLOMON, NORTHEAST—Ellis, February; Continental Oil Co. 1 Vine, NE NE NW 23-11s-19w, Arbuckle, 3,468-85 ft., 125 bbl. oil, TD 3,485 ft. 18 wells at year end.

SPRING CREEK—Trego, October; Peel-Hardman 1 Lang, SE SE SE 32-12s-21w, Arbuckle, 3,905-11 ft., 71 bbl. oil, TD 3,951 ft.

STEPHENS—Phillips, August; National Associated Petroleum Co. 1 Stephens, NW NE NE 21-1s-18w, Lansing-Kansas City, 3,382-88 ft., and 3,398-3,404 ft., 169 bbl. oil, TD 3,482 ft. 5 wells at year end.

STUTTGART—Phillips, January; Imperial Petroleum Co., Inc., 1 Vogel, SE SE NE 14-3s-19w, Lansing-Kansas City, 3,145-50 ft., 503 bbl. oil, TD 3,150 ft. 8 wells at year end.

STUTTGART, SOUTH—Phillips, April; Westgate-Greenland Oil Co. 1 Ehm, NW NW SE 23-3s-19w, Lansing-Kansas City, at intervals from 3,188-3,293 ft., 11 bbl. oil, TD 3,488 ft.

SWEET—Rooks, October; Westgate-Greenland Oil Co. 1 Sweet, NE NE SE 18-8s-18w, Arbuckle, 3,423-62 ft., 7-10 bbl. oil, TD 3,489 ft., OWPB.

THREE MILE CREEK, SOUTH—Morris, January; Loriaux 1 Gross, NE NE SE 35-16s-5e, Chattanooga, 2,183-2,212 ft., 35 bbl. oil, TD 2,212 ft. 3 wells at year end.

TOULON—Ellis, November; El Dorado Refining Co. 1 Braun, SW NE NE 34-13s-17w, Arbuckle, 3,480-94 ft., 228 bbl. oil, TD 3,494 ft. 4 wells at year end.

WAKEFIELD, NORTHEAST—Clay, June; K. I. Turner et al 1 Tannehill, 1,320 ft. NL and 1,220 ft. WL NW 15-9s-4e, Burgess sand and Mississippian chert, 1,903-22 ft., 3 bbl. oil, TD 1,922 ft.

WEARNE—Barton, August; Coppinger 1 Wearne, NW SW NE 4-20s-12w, Arbuckle, 3,384-3,402 ft., 182 bbl. oil, TD 3,402 ft.

WENDELBURG — Stafford, September; Todd Drilling Co. 1 Wendelburg, SE SW NE 19-23s-11w, Arbuckle, 3,729-32 ft., 371 bbl. oil, TD 3,732 ft.

WERNER-ROBL, NORTHWEST—Barton, April; W. L. Hartman 1 E. Robl, NW NW SE 23-19s-12w, Lansing, 3,115-25 ft., 3,092-3,100 ft., 190 bbl. oil, TD 3,413 ft.

WERNER-ROBL, SOUTH—Barton, August; Hartman 1 Pohlman, SW SE SW 30-19s-11w, Arbuckle, 3,347-51 ft., 50 bbl. oil, TD 3,351 ft.

WERNER-ROBL—Barton, January; W. L. Hartman 1 Werner, SW NW NW 30-19s-11w., Lansing-Kansas City, 3,088-3,339 ft., 347 bbl. oil, TD 3,400 ft.

WHEAT—Wabaunsee, May; Carter Oil Co. 1 Helen Wheat, NW SE NE 10-15s-11e, Simpson sandy dolomite, 3,230-34 ft., 76 bbl. oil, TD 3,234 ft.

WHISMAN—Rooks, January; Derby Oil Co. et al 1 Whisman, NW NW SE 9-9s-20w, Lansing-Kansas City, 3,427-36 ft., 5 bbl. oil, TD 3,702 ft.

WHITEWATER, NORTH—Butler, April; Rex & Morris Drilling Co. 1 Johnson, SE SE SW 29-25s-4e, Viola, 2,700-02 ft., 35 bbl. oil, TD 2,702 ft.

WOODBURY—Wabaunsee, January; Carter Oil Co. 2 Woodbury, SE NW NE 11-15s-10e, Viola, 3,223-28 ft., 108 bbl. oil, TD 3,335 ft.

WORCHESTER—Graham, November; Sidney 1 Worchester, NW NW NW 23-7s-22w, Arbuckle, 3,791 ft., 237 bbl. oil, TD 3,798 ft.

ZOGLMAN — Sumner, June; Petroleum Trading & Transport Co. et al 1 Zoglman, NE SE SW 8-31s-1w, Simpson, 4,034-38½ ft., 86 bbl. oil, TD 4,060 ft.

UNNAMED—Barton, December; Picknell 1 Putnam, SW SW SW 1-17s-14w, Lansing-Kansas City, 3,225-33 ft., 287 bbl. oil, TD 3,530 ft., PBTD 3,245 ft.

UNNAMED—Butler, June; Burr & Dombauch et al 1 Gray, 990 ft. NL and 330 ft. EL Lot 22 6-27s-8e, Bartlesville, 2,672-90 ft., 20 bbl. oil, TD 2,693 ft.

UNNAMED—Cowley, December; Switherman and Cohen 1 McKay, SE SE NE 17-35s-4e, Bartlesville sand, 3,314-25 ft., 138 bbl. oil, TD 3,325 ft.

UNNAMED — Cowley, December; Crest Drilling-National Coop. 1 Morgan, CNL SW NW 23-34s-3e, 3,281-3,302 ft., 35 bbl. oil, TD 3,302 ft.

UNNAMED—Ellis, November; Francis Oil & Gas Co. 1 Fischer, SW SW NW 5-1s-20w, Arbuckle, 3,680-84 ft., 120 bbl. oil, TD 3,684 ft.

UNNAMED — Ellis, November; Anschutz Drilling Co. et al 1 Braun, SW NE NE 34-13s-17w, Arbuckle, 3,478 ft., 228 bbl. oil, TD 3,494 ft.

UNNAMED—Greenwood, May; Inland Oil, Inc., 1 Mignot, 480 ft. W and 330 ft. NL NW 9-22s-11e, Bartlesville, 1,926-31, 1,952½-60 ft., 5 bbl. oil, TD 1,974 ft.

UNNAMED — Kingman, November; Iron Drilling Co. 1 Boyle, SW NW NW 23-30s-8w, Mississippian, 4,238-60 ft., 270 bbl. oil, TD 4,755 ft.

UNNAMED—Meade, August; Skelly Oil Co. 1 Theis "B," SW SW NE 11-34s-26w, Morrow 5,736-52 ft., 5,757-71 ft., 28 bbl. oil, TD 6,123 ft.

UNNAMED—Rooks, December; M. Sitrin 1 Ostmeyer, NW NW SW 31-6s-19w, 3,545-56 ft., 60 bbl. oil, TD 3,556 ft.

UNNAMED — Rush, December; Kelinson et al 1 Pfiefer, NW NW NW 6-16s-17w, Lansing, 3,342-46 ft., 160 bbl. oil, TD 3,512 ft.

UNNAMED—Sedgwick, November; Drillers Producing Co. 2 Petrie, NE SW NW 35-26s-1w, Viola, 3,447-48 ft., 30 bbl. oil, TD 3,466 ft.

NEW PAYS

BARRETT—Barton, October; Anschutz 1 Fleming, SW SW NE 36-16s-14w, Lansing, 3,353-58 ft., 203 bbl. oil, TD 3,467 ft.

BEAVER, NORTHWEST—Barton, August; Phillips 3 Hilgenberg, SW SE NW 5-16s-12w, Toronto, 2,938-3,088 ft., 133 bbl. oil, TD 3,264 ft.

CHANCE—Pratt, January; Rine Drilling Co. 1 Jo, NE NE SW 33-26s-13w, Viola, 15 bbl., TD 4,260 ft.

DARTHMOUTH, NORTHWEST — Barton, August; GMR 1 Johnson "B," SW SW SW 28-19s-12w, Arbuckle, 3,381-89 ft., 487 bbl. oil, TD 3,389 ft.

DREILING — Ellis, January; Glickman-Veeder 1 Tholens, SW NW SE 22-14s-16w, 3,118-21 ft., and 3,258-62 ft., 251 bbl. oil, TD 3,409 ft.

DRESDEN—Kingman, August; Lion Oil Co. 1 Smalley, NW NW NE 24-27s-10w, Mississippian lime, 4,002-10 ft., 28 bbl. oil, TD 4,281 ft.

DUGGAN—Stafford, April; Harbar Drilling Co. 1 Hullman, SW SE SW 30-21s-11w, Simpson, 282 bbl. oil, TD 3,516 ft.

EVERS—Pawnee, September; Iron Drilling Co. 1 Prosser, SW SW SE 36-21s-16w, Arbuckle, 3,908-26 ft., 4,300 M.c.f. gas, TD 3,937 ft.

FT. ZARAH—Barton, January; Hartman 1 Harris, SE SE NW 30-19s-12w, Lansing-Kansas City, 3,355-63 ft., 309 bbl. oil, TD 3,407 ft.

GUELPH—Summer, November; Kanotex 1 Harris, SW SW SE 31-34s-1e, Simpson, 3,875-84 ft., 186 bbl. oil, TD 3,884 ft.

HERL—Ellis, October; Lion Oil Co. 2 Herl, NW NE SE 28-14s-17w, 3,382-3,402 ft., 454 bbl. oil, TD 3,612 ft.

HICKMAN—Stafford, March; M. B. Armer 2 Gates "B," SW SE SW 27-21s-14w, Simpson, 286 bbl. oil, TD 3,780 ft.

KOBLITZ—Ellis, October; B&R 1 Stackhouse, SW NW NE 23-12s-18w, Lansing-Kansas City (?), 3,434-38 ft., 75 bbl. oil, TD 3,621 ft., OWWO.

LOOKOUT HOLLOW — Ellis, January; Brack Oil Co. 2 Ruder, SE NW NE 31-14s-18w, Lansing-Kansas City, 8 bbl., TD 3,542 ft.

McKINNEY — Meade, August; Skelly 1 Theis "B," SW SW NE 11-34s-26w, Morrow, 5,736-52 ft., and 5,757-71 ft., 21 bbl. cond., TD 6,123 ft.

MAX — Stafford, September; Northern Ordnance et al 2 Voigt, NE NE SW 12-22s-12w, Simpson sand, 3,615-17 ft., 149 bbl. oil, TD 3,665 ft.

MUNYON—Rice, August; Buhler 1 Haas, NE NE SE 33-18s-10w, Sooy, 3,270-80 ft., 30 bbl. oil, TD 3,332 ft.

PRITCHARD—Barton, October; The Texas Co. 2 Pritchard, NE NW SE 34-20s-14w, Simpson, 3,525-29 ft., 65 bbl. oil, TD 3,564 ft.

PURDYVILLE—Hodgeman, November; Armer-Coplin 4 Schraeder, SE NW NW 3-24s-24w, Sooy, 4,651-60 ft., 3,000 bbl. oil, TD 5,233 ft.

RICK, SOUTHEAST — Rice, February; Chas. Carlock 1, SW SW NE 7-19s-10w, Lansing-Kansas City, 3,026-3,340 ft., 75 bbl. oil, TD 3,456 ft.

SHOO FLY—Barton, July; Petroleum, Inc. 1 Rathburn, NW NW NE 9-17s-13w, Arbuckle, 3,359-63 ft., 160 bbl. oil, TD 3,363 ft., OWWO.

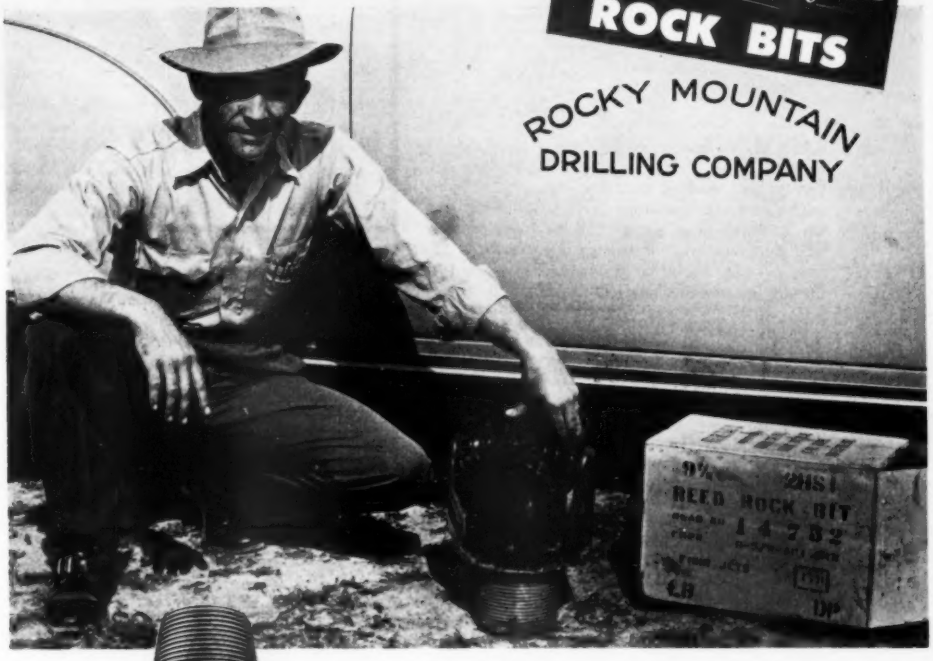
SMALLWOOD—Stafford, October; Westgate-Greenland 2 Wetig, SE NW SE 2-22s-14w, Arbuckle, 3,756-67 ft., 470 bbl. oil, TD 3,773 ft.

WALTERS—Ellis, July; Carter 1 Weisner, SE SE SE 11-12s-18w, 3,372-78 ft., 3,394-3,408

"I like this bit for hard, abrasive drilling"

...says H. A. Stripling, tool pusher in California for the Rocky Mountain Drilling Co.

REED *Liquid-blast* **ROCK BITS**



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REED ROLLER BIT COMPANY

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William M. Barret, Inc.

in observing its 25th Anniversary of service to the petroleum and mining industries, is pleased to announce the wider availability of

RADOIL

for exploration and field definition

RADOIL

WHAT IS RADOIL?

RADOIL is a geophysical technique for the *direct* location of oil. It was developed by William M. Barret, Inc., working in collaboration with its research and manufacturing affiliate, the Engineering Research Corporation. As its name implies, RADOIL employs electromagnetic energy in the form of radio waves to penetrate the earth, and thereby locate and define oil-bearing strata.

HOW DOES RADOIL OPERATE?

A "surface wave" of radio energy is directed along the air-earth boundary from an "energizer" toward a receiver. As the surface wave progresses, individual "rays" peel off by refraction and enter the earth along a multitude of parallel ray paths. As the rays strike a reflecting formation, they are partially reflected back to the earth's surface, and refracted out again toward the receiver. Due to the electrical contrast that exists at the boundary of an oil field, the character of the reflected rays discloses the presence of oil.

HOW DOES RADOIL COMPARE WITH OTHER EXPLORATORY TECHNIQUES?

There is no close parallel. While other geophysical methods seek to define a "structural prospect," RADOIL has as its objective *the direct location of a worthwhile oil field.* This does not mean that RADOIL is designed to replace other methods. On the contrary, in its present development RADOIL is more suited to detailing than to reconnaissance work and, therefore, it is best employed in areas where a prospect has already been localized by other methods. *RADOIL is competitive with the drill,* not with conventional geophysical and geological techniques.

IS RADOIL A PROVEN METHOD?

The cumulative results of more than 300 commercial surveys, conducted during the past 15 years, show that RADOIL is more reliable in determining the presence of oil than conventional geophysical methods are in determining structural conditions favorable for the accumulation of oil.

WHAT DOES A RADOIL SURVEY COST?

Service charges for RADOIL compare favorably with the cost of other geophysical surveys, but it should be remembered that the chief effectiveness of RADOIL begins where other methods leave off; that it bridges the wide gap between a structural prospect and an oil field.

ON WHAT BASIS IS RADOIL AVAILABLE?

Experienced RADOIL field crews may be secured on a contract basis, as schedules permit; or on a non-exclusive license basis to responsible parties. An adaptation of the method, known as RADORE, has also been developed for use in locating ore deposits. RADORE is available to the mining industry on the bases described above for RADOIL.

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GIDDENS-LANE BUILDING

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Shreveport, Louisiana

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ft., 245 bbl. oil, TD 3,622 ft., old Arbuckle producer WO.

WYOMING

NEW POOLS

BONANZA—Big Horn, January; Bonanza Oil Co. 1 Government, C SW NE 26-49n-91w, Tensleep, 2,480-2,528 ft., 250 bbl. oil, TD 2,528 ft. 22 wells at year end.

FISH CREEK—Natrona, July; Atlantic Refining Co. 2 Government, SW NE NE 8-31n-84w, Lakota, 995-1,034 ft., 972 M.c.f. gas, TD 1,298 ft., PB 1,245 ft. OWWO.

GLENROCK, SOUTH—Converse, February; Shell Oil Co. 1 Government, SW NW SW 15-33n-75w, Dakota, 7,094-7,114 ft., 550 bbl. oil, TD 7,131 ft. 4 wells at year end.

HAPPY SPRINGS—Fremont, September; Sinclair Oil & Gas Co. 7 Unit, NW SW NW 8-28n-93w, Frontier, 4,010-4,250 ft., 98 bbl. oil, TD 5,400 ft., PB 4,300 ft.

MANDERSON—Big Horn, September; General Petroleum Corp., Pioneer Oil Co., and Mule Creek Oil Co. 34-20-G, C SE NW 20-50n-92w, Phosphoria, 7,220-7,340 ft., 480 bbl. oil, TD 8,080 ft., PB 7,340 ft.

MEADOW CREEK, EAST—Johnson, March; American Liberty Oil Co. 1 W. P. Irvine, SW SE NE 18-41n-77w, first Frontier, 6,412-38 ft., 12 bbl. oil, TD 7,882 ft., PB 6,440 ft.

MEADOW CREEK, SOUTHEAST—Johnson, December; Sharples Oil Corp. 1-A-19 Government, NE SE NW 19-41n-77w, Lakota 7,715 ft., 20 bbl. oil, TD 7,762 ft.

NORWOOD—Washakie, February; Victor Ziegler 1 Voss, Tract 89, 5-48n-90w, Tensleep, 1,608-12 ft., 25 bbl. oil, TD 1,612 ft.

PILOT BUTTE, SOUTH—Fremont, May; Sinclair Oil & Gas Co. 1 Indian, NE NW SE 4-2n-1w (Wind River Meridian), Phosphoria, 6,037-6,298 ft., 60 bbl. oil, TD 6,390 ft., PB 6,298 ft.

SALT CREEK, EAST—Natrona, December; Sinclair Oil & Gas Co. 1 East Salt Creek, SE SE SW 10-40n-78w, dual completion-Lakota-second Wall Creek, Lakota 5,910 ft., second Wall Creek 4,922-60 ft., 203 bbl. oil from Lakota, 48 bbl. from second Wall Creek, TD 6,001 ft., PB 5,962 ft.

SUSSEX, WEST—Johnson, August; Continental Oil Co. 1 Unit, NW SE NW 8-42n-79w, Shannon, 2,875-2,950 ft., 450 bbl. oil, TD 6,160 ft., PB 2,950 ft. 2 wells at year end.

TEAPOT, EAST—Natrona, March; Trigood Oil Co. 2 Government, SE SW SE 24-38n-78w, Dakota, 5,828-71 ft., 500 bbl. oil, TD 5,871 ft. 2 wells at year end.

TIP TOP—Sublette, May; General Petroleum Corp., 4X-12-G, SW SW NW 12-28n-114w, Nugget, 9,682 ft., 266 bbl. oil, TD 9,807 ft.

WHISTLE CREEK—Park, November; Seaboard Oil Co. 1 State Unit, NE NW SW 16-56n-98w, Tensleep, 5,795-5,825 ft., 255 bbl. oil, TD 5,825 ft. 2 wells at year end.

NEW PAYS

BEAVER CREEK—Fremont, July; Stanolind Oil & Gas Co. 15 Unit, SE SW NW 1-33n-96w, Mesaverde, 3,693-3,828 ft., 226 bbl. oil, TD 3,828 ft. 4 wells at year end.

BIG MUDDY, EAST—Converse, February; Southern Production Co. and Dyer Drilling Co. E-1 Smith Anderson, C NW NW 1-33n-76w, Muddy, 4,773-4,781 ft., 550 bbl. oil, TD 4,980 ft. 6 wells at year end.

ELK BASIN, SOUTH—Park, February; Continental Oil Co. 16 Unit, NW NE SE 19-57n-99w, Frontier, 5,127-5,193 ft., 200 bbl. oil, TD 5,193 ft. 3 wells at year end.

GEBO—Hot Springs, September; Continental Oil Co. 32 Unit, NW NW SE 23-44n-95w, Tensleep, 4,842-5-5,140 ft., 500 bbl. oil, TD 5,198 ft., PB 5,140 ft.

LAMB—Big Horn, March; Pond Petroleum Co. 1 Government, SE SE NW 12-51n-93w, Madison, 3,812-3,991 ft., 40 bbl. oil, TD 3,991 ft. 1 well at year end.

MEADOW CREEK, EAST—Johnson, March; American Liberty Oil Co. 2 V. M. Irvine, SW NW NW 7-41n-77w, Shannon, 4,255-4,290 ft., 10 bbl. oil, TD 7,556 ft., PB 4,290 ft.

MEADOW CREEK—Johnson, January; Continental Oil Co. 33 Unit, NW NE SW 2-41n-78w, Shannon, 4,224-4,268 ft., 3,000 M.c.f. gas, TD 4,268 ft.

RIVERTON—Fremont, September; Atlantic Refining Co. 3 Unit, C SW NE 25-1s-4e (Wind River Meridian), Phosphoria, 11,586-11,623 ft., 101 bbl. cond., TD 12,335 ft., PB 11,623 ft.

SUSSEX—Johnson, June; Continental Oil Co. 59 Unit, SW NW SE 17-42n-78w, Tensleep, 9,104-9,299 ft., 1,400 bbl., TD 9,299 ft. 2 wells at year end.

COLORADO

NEW POOLS

ATWOOD—Logan, November; Trigood Oil Co. 9 J. Pomeroy, SE SW SE 20-7n-53w, J sand, 4,720-25 ft., 70 bbl. oil, TD 4,734 ft. 2 wells at year end.

DOUGLAS PASS—Garfield, December; Greenbrier Oil Co. 1 Government, C NW NW 24-5s-102w, Entrada 7,135-55 ft., 7,700 M.c.f. gas, TD 8,905 ft.

GRAYLIN—Logan, May; British-American Oil Producing Co. 1 Monroe, NE NE SW 7-8n-53w, D sand, 4,996-5,028 ft., 95 bbl. oil, TD 5,525 ft., PB 5,028 ft. 7 wells at year end.

HELLS HOLE—Rio Blanco, January; Roy D. Johnson et al. 1 Government, C SE 12-2s-104w, Mesaverde, 2,300-2,495 ft., 11,200 M.c.f. gas, TD 2,495 ft.

HOOVER—Logan, November; H. C. Arnold et al. 1 Hoover, NE NE SW 3-7n-54w, J sand, 4,914 ft., 62 bbl. oil, TD 5,038 ft.

LOGAN—Logan, July; Plains Exploration Co. 1 Dalke, SE SE SW 22-8n-54w, J sand, 5,195 ft., 12 bbl. oil, TD 5,303 ft. 3 wells at year end.

LITTLE BEAVER CREEK—Adams, May; Orrin Tucker et al. 1 Hough, NW NE NE 1-2s-57w, D sand, 5,188 ft., 11,500 M.c.f. gas, TD 5,560 ft. 2 wells at year end.

MESSES—Morgan, June; South Texas Development Co. 1 State, NE NE NW 1-5n-55w, Dakota, 5,021 ft., 132 bbl. oil, TD 5,125 ft. 1 well at year end.

PADRONI—Logan, July; The Texas Co. 1 D. E. Gould, SW SW SW 20-9n-52w, J sand, 4,625-93 ft., 4,000 M.c.f. gas, TD 5,214 ft., PB 4,693 ft.

SAND CREEK—Logan, October; Sinclair Oil & Gas Co. 1 Phillips, NE NW SW 19-7n-54w, D sand, 5,112-45 ft., 230 bbl. oil, TD 5,145 ft. 3 wells at year end.

SPRINGDALE—Logan, September; Shell Oil Co. 1 State "B," SW NE NE 16-8n-53w, Dakota, 4,856 ft., 38 bbl. oil, 6,700 M.c.f. gas, TD 5,346 ft., PB 4,905 ft.

WALKER—Logan, March; British-American 1 Green, NW NE SE 20-9n-53w, J sand, 4,968-76 ft., 14 bbl. oil, TD 5,475 ft., PB 4,999 ft. 9 wells at year end.

NEW PAYS

GREASEWOOD—Weld, November; J. G. Dyer-Gifford Parker 2 Kirchoff, C SE NW 12-6n-61w, D sand, 6,740-48 ft., 27 bbl. oil, TD 6,790 ft. 2 wells at year end.

IGNACIO—LaPlata, February; Stanolind Oil & Gas Co. 2 Ute Indian B, SW NE NW 21-33n-7w, Pictured Cliffs, 2,450 ft., 3,120 M.c.f. gas, TD 3,050 ft. 3 wells at year end.

THORNBERG—Moffat, March; Continental Oil Co. 1 Lewin, SE NE SE 17-3n-91w, Weber, 4,005-4,326 ft., 11,200 M.c.f. gas, TD 7,348 ft., PB 4,326 ft.

WESTERN NEBRASKA

NEW POOLS

BIG SPRINGS—Deuel, September; C. D. Edmonson and Kansas Nebraska Natural Gas Co. 1 "E" Trollstrup, E½ NW NE 3-12n-43w, D sand, 3,208 ft., 20,000 M.c.f. gas, TD 3,365 ft.

BIG SPRINGS, WEST—Deuel, November; Ohio Oil Co. 1 "A" Troelstrup, C SW 35-13n-43w, D sand, 3,214-18 ft., 4,000 M.c.f. gas, TD 3,344 ft. 2 wells at year end.

BROWNSON, EAST—Cheyenne, October; Ohio Oil Co. 1 Runge, SE NE SE 17-14n-50w, D sand, 4,754-69 ft.

DALTON—Cheyenne, February; Recco Oil Co. and C. E. Stout 1 Foy, NE NE NE 30-17n-49w, J sand, 4,685-4,702 ft., 4 bbl. oil, TD 5,014 ft., PB 4,740 ft.

DALTON, SOUTHEAST—Cheyenne, November; Olds Oil Co. and General Production Co. 1 Laine, SW SW NE 32-17n-49w, D sand 4,641 ft., 71 bbl. oil, TD 4,729 ft.

ENDERS—Kimball, December; Twin Oil Co. and Rock Hill Oil Co. 1 F. L. Enders, NE NW SE 15-13n-55w, J sand, 6,302-54 ft., 40 bbl. oil, TD 6,354 ft. 2 wells at year end.

HARRISBURG—Banner, February; Stanolind Oil & Gas Co. et al 1 Downer, NE NE SE 6-18n-55w, J sand, 5,880-5,907 ft., 323 bbl. oil, TD 5,907 ft. 2 wells at year end.

JOHNSON—Cheyenne, May; Ohio Oil Co. 1 R. W. Johnson, SE SE SW 35-15n-49w, Dakota, 4,564-4,631 ft., 222 bbl. oil, TD 4,650 ft. 2 wells at year end.

KIMBALL—Kimball, August; Nebraska Drillers 1 Torgeson, SE NW NW 23-14n-56w, J sand, 6,506-23 ft., 150 bbl. oil, TD 6,523 ft. 2 wells at year end.

MARLOWE—Cheyenne, April; Ohio Oil Co. 1 W. A. Sparks, NW SE NE 29-15n-49w, second Dakota, 4,567-4,582 ft., 45 bbl. oil, TD 4,710 ft.

McCOURT—Cheyenne, September; Brown Drilling Co. 1 Scheeler, NE NE SE 11-16n-48w, first Dakota, 4,158 ft., 85 bbl. oil, TD 4,301 ft. 1 well at year end.

POTTER, SOUTHWEST—Kimball, September; Wytex Petroleum Co. and Derby Oil Co. 1 Dunn, NE NE SE 3-13n-53w, D sand, 5,648 ft., 12½ bbl. oil, TD 5,780 ft. 2 wells at year end.

REIMER—Cheyenne, August; Ohio Oil Co. 1 Reimer, NE SE SE 15-16n-50w, second Dakota, 4,831-33 ft., 340 bbl. oil, TD 4,925 ft. 4 wells at year end.

SISSON—Kimball, October; Gulf 1 Sisson, NW NW NW 18-12n-58w, J sand, 7,326-54 ft., 260 bbl. oil, TD 7,431 ft. 2 wells at year end.

UTAH

NEW POOLS

CLEAR CREEK—Carbon, November; Byrd-Frost, Inc. 1 Utah Fuel Co., NW SW SE 5-14s-7e, Ferron sand, 4,340 ft., 10,000 M.c.f. gas, TD 4,761 ft., PB 4,711 ft.

DUCHESNE—Duchesne, July; Carter Oil Co. and Continental Oil Co. 1 Ute Tribal, C SE NE 17-4s-4w, basal Green River, 7,486 ft., 143 bbl. oil, TD 7,596 ft.

RED WASH—Uintah, February; The California Co. 1 Unit, NE NE NE 26-7s-23e, basal Green River, 5,160-5,270 ft., 392 bbl. oil, TD 5,270 ft. 9 wells at year end.

MONTANA

NEW POOL

RICHEY—Dawson, December; Shell 1 Northern Pacific, SE NW NW 19-23n-50e, Charles, 6,695 ft., 1,656 bbl. oil, TD 10,518 ft., PB 7,275 ft.

NORTH DAKOTA

NEW POOL

BEAVER LODGE—Williams, December; Amerada Petroleum Corp. 1 Clarence Iverson, C SW SW 6-155n-95w, Madison, 7,135-55 ft., 25 bbl. oil, TD 11,955 ft., PB 8,364 ft.

NORTHERN NEW MEXICO

NEW POOLS

HART MOUNTAIN—San Juan, February; Delhi Oil Corp. 1 Atlantic Federal, NW SW NE 25-31n-10w, Cliffhouse, 5,003 ft. to 5,177 ft., 994 M.c.f. gas, TD 5,177 ft.

GOVERNADOR, SOUTH—Rio Arriba, January; Byrd-Frost, Inc. 1 Nickson, C NE NE 33-28n-7w, Point Lookout, 4,210-4,891 ft., 487 M.c.f. gas, TD 5,210 ft. PB 5,020 ft.

LARGO, SOUTH—Rio Arriba, September; Thomas Doswell 2 Doswell, C NW SE 9-26n-6w, Tocito, 6,622-40 ft., 464 bbl. oil, TD 6,692 ft. 3 wells at year end.

STONEY BUTTES—San Juan, February; Southern Union Oil Co. 1 Navajo, SW NE NE 1-21n-14w, Dakota 3,554 ft., 40 bbl. oil, TD 3,644 ft.

NEW PAY

TABLE MESA—San Juan, January; Continental Oil Co. 17 Table Mesa, SE SE SW 3-27n-17w, Ouray limestone, 7,450-7,533 ft., 190 bbl. oil, TD 7,761 ft.

CALIFORNIA

NEW POOLS

ANAHEIM—Orange, January; P. A. Doheny 1 Holsinger, NW NE 22-4s-10w, middle Pico (Pliocene), 4,338-4,503 ft., 50 bbl. oil, TD 4,631 ft.

ARVIN—Kern, July; The Texas Co. 1

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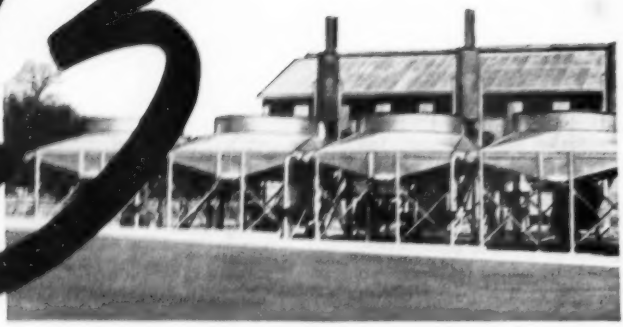

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2. FLEXIBLE DESIGN—you can get either the radiator core or fintube type cooler from ALCO, powered by electricity, steam, gas or oil.

3. EFFICIENT PERFORMANCE—induced draft design eliminates the chance of recycling hot air with a subsequent loss in heat transfer.

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5. QUICK INSTALLATION—for fast field assembly, every part is marked and identified on assembly drawings so that no specialized labor is required.

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George, NE NW 23-21s-29e, Santa Margarita (U. Miocene), 6,363-6,514 ft., 576 bbl. oil, TD 6,516 ft. 2 wells at year end.

BARDSDALE—Ventura, December; B&B Oil Co. 1 Bardsdale, SE NW 7-3n-19w, Eocene sand, 6,488-7,538 ft., 248 bbl. oil, TD 7,538 ft. 8 wells at year end.

BELGIAN ANTICLINE, NORTHWEST—Kern, November; Ohio Oil Co. 1 Tulare fee, SW SW 19-30s-22e, Oceanic (Oligocene), 6,045-6,521 ft., 42 bbl. oil, TD 6,971 ft.

BUTTES CREEK—Butte, August; Honolulu 1 Honolulu-Humble-Wild Goose, 17-17n-1e, 3,292-3,314 ft., 3,500 M.c.f. gas, TD 4,009 ft.

CAMDEN—Fresno, June; E. C. Von Glahn 1 Coleman Community, SW NE 8-17s-20e, Coleman (Miocene), 6,126-38 ft., 92 bbl. oil, TD 7,602 ft.

CASTAIC HILLS—Los Angeles, September; Ted Sterling (now Continental Oil Co.) 1 Rynne-Fisher, NE NE 35-5n-17w, Mohnian (U. Miocene), 4,642-96 ft., 233 bbl. oil, TD 4,742 ft.

CORNING, SOUTH—Tehama, February; Buttes Oil Fields, Inc., A Saldubehere-Buttes, SE SE 25-24n-3w (4 mi. south of Corning field), Eocene, 1,560-75 ft., 10,000 M.c.f. gas, TD 2,365 ft. 2 wells at year end.

CUYAMA, CENTRAL—Santa Barbara, May; Seaboard Oil Co. 78-22 Seaboard et al, SE SE 22-10n-26w, Bitter Creek (m. Miocene) 7,272-78, 7,362-72 ft., 79 bbl. oil, TD 10,097 ft.

DEL REY, EAST—Los Angeles, December; Bolsa Chica Oil Corp. 1-1 Kidson, 22-2s-15w, Miocene schist conglomerate, 7,375-85 ft., 100 bbl. oil, TD 7,418 ft.

DEVILS DEN—Kern, September; Gilliland Oil Co. 2 Strode, SE NE 15-25s-18e, Point of Rocks (Eocene), 3,183-3,250 ft., 200 bbl. oil, TD 3,335 ft. 3 wells at year end.

LA HABRA HEIGHTS—Los Angeles, September; R. E. Bering, Opr. 1 York, SE SE 30-2s-10w, 2,604-3,149 ft., 146 bbl. oil, TD 3,749 ft.

LOS LOBOS, SOUTH—Monterey, March; Jergins Oil Co. 1 Aurignac, NE NW 9-23s-10e, Monterey (Miocene), 3,480-3,510 ft., 14 bbl. oil, TD 4,341 ft.

McKITTRICK—Kern, October; E. A. Bender et al 1 Anderson, SE NE 15-30s-21e, Phacoides sand (Miocene), 4,605-30 ft., 250 bbl. oil, TD 5,011 ft. 2 wells at year end.

MOUNTAIN VIEW, SOUTHEAST AREA—Kern, February; Independent Exploration Co. 1 Means, SW NW 34-30s-29e, Chance (U. Miocene), 4,267-4,608 ft., 175 bbl. oil, TD 4,918 ft.

OAT MOUNTAIN—Los Angeles, October; E. W. Pauley 36 Blow, NE SW 19-3n-16w, (Miocene sand) 9,300-68 ft., 400 bbl. oil, TD 9,368 ft.

PLEITO CREEK—Kern, May; Humble Oil & Refining Co. 1 K.C.L.-B, SE NW 35-11n-27w, Santa Margarita (U. Miocene), 4,212-4,335 ft., 25 bbl. oil, TD 4,387 ft. 3 wells at year end.

PYRAMID HILLS, SOUTH—Kings, July; Norris Oil Co. 115-28 "Well," NW SW 28-24s-18e, Temblor (M. Miocene), 852-92 ft., 60 bbl. oil, TD 893 ft.

ROSEDALE—Kern, September; Humble Oil & Refining Co. 1 Rosedale Stevens-Community, NW SE 15-29s-26e, Stevens sand, 5,890-5,955, 507 bbl. oil, TD 7,321 ft.

SALT CREEK—Kern, October; Ferguson & Bosworth 1 Richardson, SW NE 18-29s-21e, Phacoides (Miocene), 838-1,288 ft., 25 bbl. oil, TD 1,400 ft. 4 wells at year end.

SALT CREEK, SOUTH—Kern, July; Ferguson & Bosworth 2 Anderson, SW SW 19-29s-21e, Phacoides sand (Miocene), 453-496 ft., 30 bbl. oil, TD 496 ft.

SANTA CLARA—Los Angeles, July; Southern California Petroleum Corp. 1 N. L. & F., NE SE 20-4n-17w, (Miocene), 8,882-8,962 ft., 165 bbl. oil, TD 9,022 ft.

WELDON CANYON—Ventura, June; Union Oil Co. 2 Rancho Ex-Mission, proj. 3-3n-23w, (L. Pliocene), 3,027-3,110 ft., 95 bbl. oil, TD 3,171 ft. 2 wells at year end.

NEW PAYS

ALISO CANYON—Los Angeles, September; Carlton Beal 2 Mission-Adrian, 34-3n-16w, Repetto (Pliocene), 6,920-7,320 ft., 245 bbl. oil, TD 7,580 ft.

BACON HILLS, WEST—Kern, September; Superior Oil Co. 54-20 Theta, SE NE 20-28s-20e, middle Miocene sand, 2,185-2,210 ft., 77 bbl. oil, TD 4,563 ft.

BELGIAN ANTICLINE—Kern, May; Pacific Western Oil Co. 42-30 M.M.A., NE NW 30-30s-22e, Oceanic sand (Kreyenhagen), 4,971-5,039 ft., 694 bbl. oil, TD 5,039 ft.

BREA-OLINDA—Orange, July; General Petroleum Corp. 22 Tonner, 6-3s-9w, Miocene sand, 4,061-4,264 ft., 400 bbl. oil, TD 8,789 ft.

CUYAMA, SOUTH—Santa Barbara, April; Richfield Oil Corp. 35-5 Cox, NE SW 5-9n-26w, Hibberd sand (Miacene), 5,864-96 ft., 574 bbl. oil, TD 5,988 ft.

EDISON—Kern, August; Golden Bear Oil Co. 1 Seale, NW NW 5-30s-29e, Wicker sand, Chanac (Miocene) 3,975-4,122 ft., 80 bbl. oil, TD 4,122 ft.

EDISON, WEST—Kern, March; California Exploration Co. et al 28-2 Porter, NE SE 28-30s-29e, Santa Margarita (upper Miocene) 3,742-4,158 ft., 150 bbl. oil, TD 4,159 ft.

EDISON, WEST—Kern, June; California Exploration et al 28-4 Porter, NE SE 28-30s-29e, Chanac (upper Miocene), 3,819-4,609 ft., 222 bbl. oil, TD 4,609 ft.

EDISON, WEST—Kern, July; California Exploration Co. et al 27-1 "Well," SW SW 27-30s-29e, Chanac (upper Miocene), 4,032-4,310 ft., 175 bbl. oil, TD 4,750 ft.

EDISON, WEST—Kern, October; California Exploration Co. 28-6 Clerico, SW SE 28-30s-29e, Chanac-Santa Margarita (upper Miocene), 4,046-4,740 ft., 196 bbl. of oil, TD 5,175 ft.

ELK HILLS—Kern, February; Standard Oil Co. of California 312 36-R, NW NW 36-30s-23e, upper Stevens sand (Miocene), 6,475-6,958 ft., 2,900 bbl. oil, 7,016 ft.

ELK HILLS—Kern, December; Standard Oil Co. of California X-55 30-R, NW SE 30-30s-23e, Carneros (Miocene), 9,401-9,565 ft., 134 bbl. oil, TD 12,856 ft.

FRUITVALE—Kern, June; Morton & Dol-

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ley et al 43 Kernco, SE NW 34-29s-27e, Kernco sand of Chanac (Miocene), 4,110-4,240 ft., 180 bbl. oil, TD 4,296 ft.

HUNTINGTON BEACH—Orange, August; C. S. Black 1 Black Oil, 2-6s-11w, Miocene, 3,557-3,922 ft., 58 bbl. oil, TD 5,400 ft.

LONG BEACH—Los Angeles, April; Golden Dome Oil Co., Inc. 1 Wardlow, 18-4s-12w, Wardlow sand (Miocene), 6,655-7,320 ft., 780 bbl. oil, TD 7,445 ft.

MONTALVO, WEST—Ventura, February; Standard Oil Co. of California 148-12 McGrath, 26-2n-23w, Sespe (Oligocene), 11,810-21 ft., 238 bbl. oil, TD 12,110 ft.

NEWHALL TOWNSITE—Los Angeles; March; Talisman Oil Co. 1 Braille, 1-3n-16w, Braille sand (Pliocene), 3,150-96 ft., 52 bbl. oil, TD 3,196 ft.

NEWPORT, WEST—Orange, November; DeWitt Langford, Opr. 1 Oka, NW SE 18-6s-10w, Puente sand (upper Miocene), 2,015-59 ft., 70 bbl. oil, TD 5,295 ft.

RAMONA—Ventura, December; Superior Oil Co. 14 Black, NE SE 13-4n-18w, Miocene sand, 7,678-7,795 ft., 300 bbl. oil, TD 7,925 ft.

RUSSELL RANCH—Santa Barbara, October; Richfield Oil Corp. 42-6 Russell-A, NE NW 6-10n-27w, Morales sand (Pliocene), 1,051-1,107 ft., 50 bbl. oil, TD 4,520 ft.

SALT CREEK—Kern, April; Carneros Oil Co. 2-1 Anderson, NW NE 19-29s-21e, Phacoides sand (Miocene), 2,394-2,454 ft., 260 bbl. oil, TD 2,455 ft.

SEAL BEACH—Los Angeles, May; J. I. M. Petroleum Co. 1 Merritt-Taylor, 3-5s-12w, Miocene sand, 6,967-8,467 ft., 950 bbl. oil, TD 8,467 ft.

TEJON HILLS—Kern, February; Standard Oil Co. of California 58 Tejon-3, 21-11n-18w, Olcese sand (Miocene), 962-1,026 ft., 147 bbl. oil, TD 1,344 ft.

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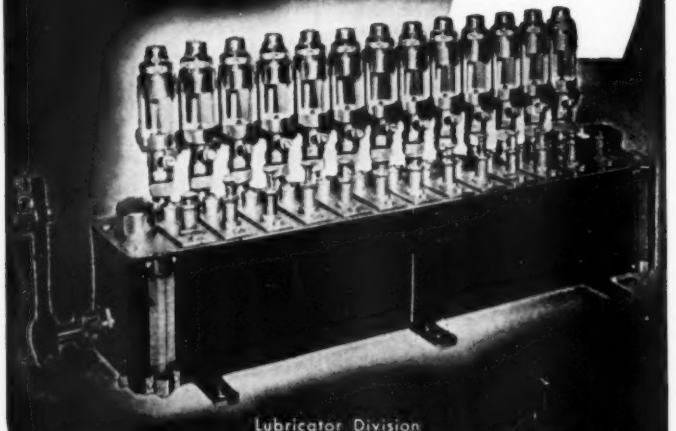

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TEJON RANCH—Kern, December; Reserve Oil & Gas Co. 58-33 "Well," SW SE 22-11n-19w, deeper Miocene sand, 4,727-4,857 ft., 3,000 M.c.f. gas, TD 4,893 ft.

WILMINGTON—Los Angeles, August; Long Beach Oil Development Co. 34 Z-1, 11-5s-13w, Tar sand of Repetto (Pliocene), 2,097-2,221 ft., 105 bbl. oil, TD 2,385 ft.

UNNAMED—Orange, September; Algonquin Oil Co. 1 "Well," 29-5s-11w, Miocene sand, 4,446-89 ft., 60 bbl. oil, TD 4,639 ft.

WASHINGTON

NEW POOL

OCEAN CITY—Grays Harbor, December; Tom Hawksworth Oil & Gas Co. 4 State, 15-18n-12w, Kincaid (Miocene), 3,588-3,714 ft., 35 bbl. oil, TD 3,714 ft.

INDIANA

NEW POOLS

ALFORDSVILLE—Daviess, July; H. H. Risher 1 C. Burris, NW NE NW 11-1n-5w, 25 bbl., Salem 975-81 ft., TD 981 ft.

ARNEY—Owen, March; W. C. Burrage 1 Stahl, 430 ft. from NL and 800 ft. from WL 22-9n-5w, 1,000,000 cu. ft. of gas, Devonian, 1,315-26 ft., TD 1,355 ft. 2 wells (gas) at year end.

BELKNAP, EAST—Posey, October; Indianna Farm Bureau 1 J. Phillips, SW NW SW 16-6n-11w, 91 bbl., Biehl sand, 1,520-29 ft., TD 1,529 ft. 3 wells at year end.

BICKNELL—Knox, March; W. G. R. Drilling Co. 2 E. Wampler, 330 ft. from SL and 990 ft. from EL MD 152-4n-8w (NE NE NE SE Projected Sec. 33-4n-8w), 40 bbl., McClosky, 1,382-84 ft., TD 1,384 ft.

BOONVILLE—Warrick, December; Sunlight Coal Co. 61 M. Carter, SW NW SE 22-5s-8w, 240 bbl., McClosky, 1,760-63 ft., TD 1,763 ft.

CABORN, SOUTH—Posey, June; W. W. Dayton 1 A. Fueger, SE SW NE 36-6s-13w, 50 bbl. Cypress, 2,368-77 ft., TD 2,377 ft.

DICKEYVILLE—Warrick, December; Tecumseh Coal Co. 1 V. T. Harold, SE NW SW 20-4s-7w, 8 bbl., Aux Vases, 1,526-32 ft., TD 1,534 ft.

ELLIOTT—Vanderburgh, July; Slagter Production Co. 1 Chandley, SW SE SW 35-4s-10w, 54 bbl., Cypress, 1,884-92 ft., TD 1,895 ft.

FORT BRANCH, NORTH—Gibson, July; Ryan & Sharp 1 E. Black, SW NW SW 4-3s-10w, 40 bbl., Aux Vases, 2,048-52 ft., TD 2,170 ft.

HAUBSTADT—Gisbon, June; Slagter Production Co. 1-A Pohl, SE NE NW 31-3s-10w, 9 bbl., Jackson, 1,855-69 ft., TD 2,317 ft.

HUNTINGBURG—Dubois, February; National Associated Petroleum Co. 1 Begle, NW NE NE 24-3s-5w, 476,000 cu. ft. of gas, Jackson, 608-22 ft., TD 1,200 ft. 2 wells at year end.

IONA—Knox, November; A. J. Slagter 1 Deem, 660 ft. from SEL and 1,200 ft. from SWL Survey 36-2n-10w, 2 bbl., Benoist, 1,682-90 ft., TD 1,861 ft.

IRELAND—Daviess, July; H. H. Risher 1 C. Burris, NW NE NW 11-1n-5w, 25 bbl., Salem, 975-77 ft., TD 980 ft.

MACKEY, WEST—Gibson, November; Cline & Lambert Drilling Co. 1 N. Annis, SE SE SE 8-3s-9w, 2,500,000 cu. ft. of gas, Cypress, 1,636-42 ft., TD 1,864 ft.

MONROE CITY, EAST—Knox, August; J. W. McClung 1 L. Mize, 1,150 ft. NEL and 1,950 ft. NWL MD 230-2n-8w, 3 bbl., McClosky, 1,501-09 ft., TD 1,512 ft. 6 wells at year end.

MONROE CITY, SOUTH—Knox, August; S. D. Jarvis 1 Helderman, 330 ft. SL, 165 ft. WL NE SE (W/2 SW NE SE) 21-2n-8w, 39 bbl., Aux Vases, 1,314-26 ft., TD 1,329 ft. 7 wells (Aux Vases) at year end.

MONTGOMERY—Daviess, January; Tecumseh Coal Co. 1 fee (Perkins), SE SE NW 16-3n-6w, 10 bbl., Salem, 1,232-54 ft., TD 2,111 ft. 4 wells at year end.

MT. VERNON, SOUTH—Posey, September; Superior Oil Co. 1 Breiner, NW NW SE 10-7s-13w, 60 bbl., Waltersburg, 1,881-86 ft. and Tar Springs, 1,997-2,008 ft., TD 2,810 ft. 4 wells at year end.

PDPM—Daviess, September; E. Michel 1 V. Ketchen, SE NE SW 19-5n-5w, 20 bbl., Aux Vases, 526-33 ft., TD 533 ft.

PATOKA, NORTH—Gibson, June; Calvert

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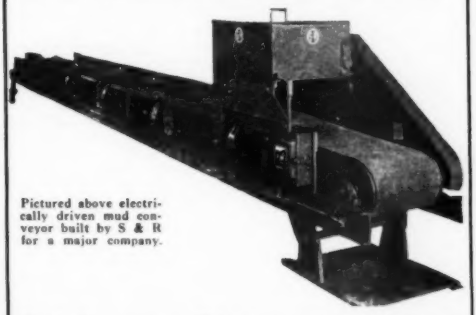

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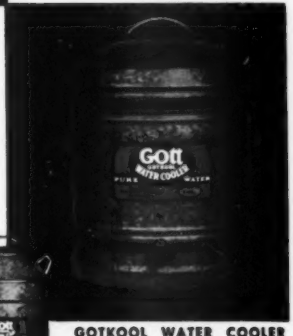

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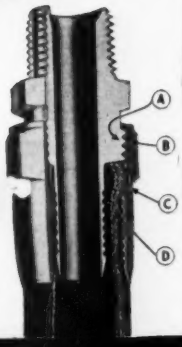

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Drilling, Inc., and Ashland Oil & Refining Co. 1 Sanders, 330 ft. from NE and NW lines Military Donation 74-1s-10w, 10 bbl. Hardinsburg, 1,330-36 ft., TD 1,912 ft.

SALINE CITY—Clay, March; Clark County Oil Research 1 C. E. and E. J. Long, SE SW SW 23-11n-7w, 15 bbl., Devonian, 1,490-84 ft., TD 1,494 ft. 2 wells at year end.

SOLITUDE, SOUTH—Posey, July; Indiana Farm Bureau 1 S. A. Reese, SW NW NW 18-6s-13w, 90 bbl., McClosky, 2,876-81 ft., TD 2,966 ft.

SOLITUDE, WEST—Posey, July; Rush Creek Oil Co. 1 Lyke-Cox Community, SW SE NE 35-5s-14w, 8 bbl., Mansfield, 1,423-40 ft., TD 1,440 ft.

STACER, WEST—Vanderburgh, May; Slagter Production Co. 1 G. J. Kissell, SW SW NE 30-4s-10w, 38 bbl., Jackson, 1,964-78 ft., TD 2,389 ft.

STEWARTSVILLE—Posey, August; Calvert Drilling, Inc., 1 Spencer, NE NW NE 13-4s-13w, 28 bbl., Aux Vases, 2,789-90 ft., TD 2,797 ft.

ST. JAMES—Gibson, August; A. W. Cherry 1 Lutz, NW NW SW 13-4s-11w, 187 bbl., Aux Vases, 2,268-94 ft., TD 2,297 ft. 4 wells at year end.

TERRE HAUTE, EAST—Vigo, May; T. & H. Corp. 1 T. Bettenbrock, 330 ft. from SL and 245 ft. from EL NE SW 36-12n-9w, 152 bbl., Devonian, 1,625-28 ft., TD 1,653 ft. 7 wells at year end.

WASHINGTON—Daviess, August; National Associated Petroleum Co. 1 Daviess County Farm, 900 ft. from NL and 2,200 ft. from EL of Projected Sec. 13-3n-7w, 28 bbl., Salem, 1,338-46 ft., TD 1,415 ft. 8 wells at year end.

WINSLOW—Pike, July; Cline & Mambert 1 Charity Farms, NE SE NW 31-1s-7w, 8 bbl., Cypress, 1,131-38 ft., TD 1,388 ft.

ZIPP—Vanderburgh, March; Calvert Drilling, Inc., 1 Murphy-Colbert, NW NW SW 30-5s-10w, 20 bbl., Pasadena, 998-1,006 ft., TD 1,010 ft.

NEW PAYS

BICKNELL—Knox, October; H. Morgan 1 Detty, 330 ft. NWL and 340 ft. NEL Military Donation 153-4n-8w, 36 bbl., Aux Vases, 1,294-1,300 ft., TD 1,352 ft.

CABORN—Posey, July; Noah Petroleum Co. 1 W. Droege, SE NW NE 5-6s-12w, 100 bbl., Palestine, 1,716-24 ft., TD 1,725 ft. 2 wells at year end.

CABORN, SOUTH—Posey, September; Slagter Production Co. 1 Lurker, NW NE SE 36-6s-13w, 22 bbl., Degonia, 1,633-43 ft., TD 2,824 ft.

CLAYPOLE HILLS—Knox, August; Carter Oil Co. 4 G. A. Steckler, NW SW SW 36-1n-12w, 176 bbl., Benoist, 2,073-86 ft., TD 2,165 ft. 11 wells at year end.

EUREKA—Spencer, January; H. W. Patterson 1 W. B. Richardson, SW NE NE 33-7s-7w, 28 bbl., lower O'Hara, 1,593-1,602 ft., TD 1,639 ft.

FARMERSVILLE—Posey, February; W. A. Schuller 1-A William Mattingly, 1,020 ft. from NL and 1,302 ft. from WL NW NW 31-6s13w, 120 bbl., Aux Vases, 2,708-20 ft., TD 2,725 ft.

FORD, SOUTH—Posey, August; Ashland Oil & Refining Co. and Dee Miller 1 A. Dirschaurer, NW SW SW 27-6s-12w, 168 bbl., Aux Vases, 2,634-46 ft., TD 2,646 ft.

FORD, SOUTH—Posey, October; Ashland Oil & Refining Co. 12 M. Appel, SE NW SW 27-6s-12w, 225 bbl., McClosky, 2,694-2,701 ft., TD 2,709 ft.

FORT BRANCH, NORTH—Gibson, December; Ryan & Sharp 1 W. R. Stevens, NE SE SE 5-3s-10w, 7 bbl., O'Hara, 2,069-73 ft., TD 2,187 ft.

HOVEY, WEST—Posey, September; C. L. McMahon 1 Gray Estate, NW NW SE 35-7s-13w, 121 bbl., lower Renault, 2,700-05 ft., TD 2,900 ft.

HUNTINGBURG—Dubois, September; Dale Drilling Co. 2 L. Mehne, SW NE SE 8-3s-5w, 25 bbl., Cypress, 836-54 ft., TD 854 ft.

IONA—Knox, December; Cline & Lambert 1 Pea, 330 from NWL and 2,350 ft. from NEL Survey 41-2n-10w, 6 bbl., Aux Vases, 1,711-16 ft., TD 1,827 ft.

LAMOTT—Posey, April; Calvert Drilling, Inc., 1 Keck Heirs, SE NW NE 18-7s-12w, 41 bbl., McCloskey, 2,679-82 ft., TD 2,696 ft.

MACKEY, WEST—Gibson, October; Cline & Lambert Drilling Co. 1 Zint, SE SW NE 8-3s-9w, 17 bbl., Aux Vases, 1,818-26 ft., TD 1,882 ft.

MONROE CITY, SOUTH—Knox, August; S. D. Jarvis 2 Helderman, 330 ft. NL and 165 ft. WL NE SE (W/2 NW NE SE) 21-2n-8w, 85 bbl., Rosiclare, 1,389-92 ft., TD 1,392 ft. 3 wells at year end.

PLAINVILLE—Daviess, February; B.L.&S. Drilling Co. 3 Plainville Unit 14, 290 ft. from SL and 1,030 ft. from WL SE 2-4n-7w, 14 bbl., Devonian, 1,982-2,018 ft., TD 2,413 ft.

ST. PHILLIPS—Posey, June; Skiles Oil Corp. 1 O. Seiler, NE NE SE 24-6s-12w, 500 bbl., Biehl, 1,595-1,613 ft., TD 2,305 ft. 4 wells at year end.

UPTON—Posey, August; Skiles Oil Corp. 1 Gyger Community, 580 ft. from NL and 3,200 ft. from EL 7-7s-14w, 82 bbl., Tar Springs, 2,142-52 ft., TD 2,163 ft. 7 wells at year end.

VIENNA, NORTH—Vanderburgh, February; Barron Kidd 1 M. Harris, 330 ft. from SL and 1,150 ft. from EL SE SW 18-5s-11w, 70 bbl., lower O'Hara, 2,652-63 ft., TD 2,792 ft.

WASHINGTON—Daviess, August; National Associated Petroleum Co. 3-B Daviess, 600 ft. from NL and 1,550 ft. from EL of Projected Sec. 13-3n-7w, 8 bbl., Aux Vases, 867-84 ft., TD 884 ft.

WELBORN—Posey, June; O. L. Sturbois 1 J. Bundy, SE SE SE 17-6s-14w, 100 bbl., Palestine, 1,918-27 ft., TD 2,520 ft. 2 wells at year end.

WESTERN KENTUCKY

NEW POOLS

BASKETT—Henderson, September; Joe Resnik 1 G. Farley, 1,460 ft. from SL and 3,250 ft. from WL, 130 bbl., O'Hara, 2,319-25 ft., TD 2,325 ft. 12 wells at year end.

COMER—McLean, July; George S. Engle 1 Warren, E/ NW SW SW 8-N-25, 10 bbl., Cypress, 2,014-17 ft., TD 2,017 ft. 2 wells at year end.

ELAM FLATS—Henderson, October; Nash Redwine et al 1 T. Alexander, 1,440 ft. from SL and 1,580 ft. from WL 10-P-24, 25 bbl., Aux Vases, 2,242-49 ft., TD 2,381 ft.

GREENBRIER, SOUTH—Henderson, December; Tuley & Carter 1 V. A. Royster, WL SE SE NE 5-N-24, 115 bbl., Hardinsburg, 1,992-2,005 ft., TD 2,010 ft.

HENDERSON, SOUTH—Henderson, September; G. S. Engle 1 W. T. Posey, 2,400 ft. from S and W lines 14-P-23 (N/w SE NE SW), 15 bbl., McClosky, 2,594-99 ft., TD 2,604 ft. 7 wells (McClosky) at year end.

HUNTS SCHOOL (ROY)—Muhlenberg, May; Roy Beard 1 W. Hunt, NE SE SE SE 20-H-31, 10 bbl., Jackson, 522-42 ft., TD 542 ft. 2 wells at year end.

ONTON, NORTH—Webster, November; Ralph Halbert 1 Hartford, 5,050 ft. from NL and 50 ft. from WL 5-M-26, 180 bbl., Tar Springs, 1,972-82 ft., TD 1,982 ft.

POND RIVER—Hopkins, December; LaFitte Co. 2 LaFitte Co. (Minerals), 14-L-26, 45 bbl., Tar Springs, 2,053-70 ft., TD 2,765 ft.

RICHELIEU—Logan, December; G. G. Fisher 1 Chyle, C NW NW 8-F-34, 5 bbl., Devonian, 1,304-35 ft., TD 1,475 ft.

RUSSELL SCHOOL—Daviess, March; Simon Lebow 1 Nile Mosley, SE NW NE NE 2-M-30, 50 bbl., Tar Springs 946-63 ft., TD 963 ft.

SMITHS MILL, NORTH—Henderson, December; Joe Reznik 1 J. L. Dorsey, NE NE NW 18-Q-21, 18 bbl., McClosky, 2,629-34 ft., and 2,647-56 ft., TD 2,744 ft.

NEW PAYS

BALD KNOB—Webster, October; Iley Browning et al 2 T. M. Cottingham, 2,450 ft. from SL and 200 ft. From WL 20-N-23, 87 bbl., McClosky, 2,635-54 ft., TD 2,700 ft.

BALD KNOB—Webster, October; T. J. Pate et al 1 G. Adamson, 2,350 ft. from NL and 2,100 ft. from EL 20-N-23, 3 bbl., Pennsylvanian sand, 1,430-40 ft., TD 2,665 ft.

BALD KNOB—Webster, June: W. F. Lacy et al 1 L. B. Newton Heirs, 750 ft. from SL and 400 ft. from WL 20-N-23, 53 bbl., Hardingsburg, 2,010-20 ft., TD 2,020 ft. 19 wells at year end.

BALD KNOB—Webster, July: W. F. Lacy et al 2 L. B. Newton Heirs, 790 ft. from SL and 920 ft. from WL 20-N-23, 62 bbl., Tar Springs 1,850-60 ft., TD 2,027 ft.

BASKET—Henderson, October; Coy Oil Co. 1 Rash Minerals, 850 ft. from NL and 1,000 ft. from WL 16-Q-25, 30 bbl., Waltersburg 1,626-36 ft., TD 2,421 ft.

COMER—McLean County, December; Sun Oil Co. 1 L. Mackey, 624 ft. from NL and 50 ft. from WL 12-N-25, 10 bbl., Waltersburg, 1,594-1,606 ft., TD 1,606 ft.

EUTERPE, NORTH—Henderson, July; Dale Hopkins 1 Phillips, NW SW SE NW 6-O-26, 80 bbl., Cypress, 1,884-93 ft., TD 1,905 ft. 4 wells at year end.

GENEVA—Henderson, August; C. E. Woods 11 fee, 4,540 ft. from SL and 650 ft. from EL 20-Q-21, 60 bbl., Aux Vases, 2,548-55 ft., TD 2,610 ft. (WO).

HEBBARDSVILLE—Henderson, March; Buckmann & O'Neal 1 A. Boswell, 1,050 ft. from EL and 750 ft. from SL 24-P-26, 10 bbl., lower O'Hara, 2,213-20 ft., TD 2,305 ft.

HENDERSON, SOUTH—Henderson, September; T. S. Engle 1 A. Posey, 2,720 ft. from SL and 1,200 ft. from WL 17-P-23, 125 bbl., Waltersburg, 1,700-06 ft., TD 1,710 ft.

LITTLE ZION—Ohio, July; W. Briney et al 3 Hamilton Brothers, NE NE NE NE 8-N-32, 3 bbl., Cypress, 763-88 ft., TD 788 ft. 2 wells at year end.

PRATT—Webster, December; Basin Oil Corp. 2 Luther Royster, S/2 NE SE SW 7-N-24, 100 bbl., McClosky, 2,526-38 ft., TD 2,570 ft. 2 wells at year end.

OAK GROVE—Henderson, May; George Hoffman et al 1 P. S. Nunnelly, 900 ft. from SL and 1,850 ft. from EL 19-P-25, 21 bbl., Benoist 2,098-2,106 ft.

POND RIVER—Hopkins, December; George Hoffman 1 C. Coombs Community, NE NW SW 14-L-26, 240 bbl., Aux Vases, 2,631-39 ft., (Perf.), TD 2,782 ft.

POOLE, WEST—Webster, August; George S. Engle 2 Allen Heirs, 1,000 ft. from SL and 3,375 ft. from WL 6-N-23, 128 bbl., Cypress, 2,301-11 ft., TD 2,311 ft.

TUNNEL HILL—Henderson, May; Carter Oil Co. 4 Ray Tapp, 1,400 ft. from SL and 1,900 ft. from 23-O-23, 77 bbl., Waltersburg, 1,746-70 ft., and Benoist (New Pay), 2,380-89 ft., TD 2,627 ft.

ZION—Henderson, June; Ellis-Morrison et al 1 J. W. Galloway et al, 640 ft. from SL and 160 ft. from WL 17-P-25, 40 bbl., O'Hara, 2,367-71 ft., TD 2,427 ft.

ZION, NORTH—Henderson, June; F. M. Ashby and Ashland Oil & Refining Co. 1 J. E. Gregory, 1,900 ft. from NL and 15 ft. from WL 1-p-25, 30 bbl., Waltersburg, 1,382-89 ft., TD 1,405 ft.

ILLINOIS

NEW POOLS

ASSUMPTION, SOUTH—Christian, December; The Texas Co. 1 Kemmerer Orphanage, SE NW SE 14-21n-1e, 26 bbl., Devonian, 2,632-47 ft., TD 2,720 ft.

BEAUCOUP—Washington, August; Collins Brothers and Obering 1 Wm. Meinert, NW NE SW 10-2s-2w, 50 bbl., Silurian, 3,076-80 ft., TD 3,080 ft.

BEAUCOUP, SOUTH—Washington, October; Dale Hopkins 1 T. Kruski, NE NE SE 33-2s-2w, 103 bbl., Benoist 1,403-38 ft., TD 1,445 ft. 5 wells at year end.

BELLMONT—Wabash, May; George Ellison 1 Epler, NE SE NE 36-1s-14w, 240 bbl., O'Hara, 2,836-45 ft., TD 2,847 ft. 3 wells at year end.

BLAIRSVILLE, WEST—Hamilton, April; G. C. Schoonmaker 1 R. Thompson, 193 ft. from SL and 357 ft. from EL NW SW 18-4s-7e, 490 bbl., McClosky, 3,416-22 ft., TD 3,422 ft. 10 wells at year end.

BONE GAP, EAST—Edwards, February; Baron Kidd 1 A. H. Cowling, NW SE SE 4-1s-14w, 70 bbl., lower O'Hara, 2,980-3,000 ft., TD 3,115 ft.

BROUGHTON—Hamilton, August; Carter Oil Co. 1 J. Van Winkle, NE NE SW 27-6s-7e, 92 bbl. (96 BW), McClosky, 3,277-82 ft., TD 3,330 ft.

BROUGHTON, SOUTH—Saline, September; Skiles Oil Corp. 1 M. Pemberton, NW NW SW 20-7s-7e, 28 bbl., McClosky, 3,213-27 ft., TD 3,227 ft.

CANTRELL, NORTH—Hamilton, September; Ralph Halbert 1 Auten Heirs, NW NW SW 32-6s-5e, 253 bbl., Aux Vases, 3,236-50 ft., TD 3,250 ft. 4 wells at year end.

CHRISTOPHER—Franklin, February; La-Grange Petroleum Corp. 1-B Harrison-Old Ben Coal, 70 ft. from NL and 330 ft. from WL NE SW 24-6s-1e, 23 bbl., lower O'Hara, 2,675-81 ft., TD 2,822 ft.

COTTONWOOD, NORTH—Gallatin, September; S. B. Griffith-Berkman 1 Hale, SW NW NE 21-7s-9e, 39 bbl., Cypress, 2,607-24 ft., TD 2,624 ft. 4 wells at year end.

EXCHANGE, NORTH—Marion, July; Atlas Drilling Co. 1 E. Sawyer, SW SE NW 11-1n-3e, 152 bbl., McClosky, 2,715-19 ft., TD 2,831 ft.

FROGTOWN, NORTH—Clinton, April; Gulf Refining Co. 1 Frank Warnecke, NE NE NW 6-2n-3w, 165 bbl., McClosky, 1,195-1,209 ft., TD 2,340 ft. 4 wells (McClosky only) at year end.

GARDS POINT—Wabash, September; Gilliam & Co. 1 E. Miller, NE NW SW 25-1n-14w, 312 bbl., lower O'Hara, 2,838-44 ft., TD 2,844 ft.

GOLDENGATE, EAST—Wayne, November; C. E. Brehm 1 P. J. Seifert, NW NW SE 2-3s-9e, 29 bbl., lower O'Hara (Rosiclare), 3,291-96 ft., TD 3,420 ft.

HORD, SOUTH—Clay, September; Webster & Shirk 1 Roberts, NE SW SW 26-5n-6e, 350 bbl., McClosky, 2,784-89 ft., TD 2,790 ft. 3 wells at year end.

IRVINGTON, EAST—Jefferson, October; Ervin-Bassett Drilling Co. 2 Hartley, SW SW SW 19-1s-1e, 24 bbl., Pennsylvanian, 1,030-84 ft., TD 1,084 ft.

KEENVILLE, EAST—Wayne, August; Bolin & Appleby 1 Clevenger, SE NE NE 36-1s-5e, 67 bbl., McClosky, 3,165-69 ft., TD 3,172 ft. 2 wells at year end.

LEXINGTON, NORTH—Wabash, June; P. Rossi 1 E. Leitch, NW SE NW 23-1s-14w, 46 bbl., lower O'Hara, 2,931-35 ft., TD 3,004 ft.

LIVINGSTON, EAST—Madison, November; J. S. Lehwald 1 T. Voyles, SW SW NW 26-6n-6w, 4,500,000 cu. ft. gas, Pennsylvanian, 543-52 ft., TD 555 ft.

LOCUST GROVE—Wayne, February; J. M. Zanetis 1 W. F. Daubs, NE NE NE 31-1n-9e, 218 bbl., lower O'Hara, 3,234-48 ft., and McClosky, 3,278-84 ft., TD 3,306 ft. 2 wells at year end.

LYNCHBURG—Jefferson, October; Peak Drilling Co. 1 Brown, SE SE NW 8-3s-4e, 175 bbl., McClosky, 3,050-60 ft., TD 3,065 ft.

MASON, NORTH—Effingham, September; The Texas Co. 1 R. Sinnickson, NW SW NW 10-6n-5e, 53 bbl., Rosiclare, 2,363-77 ft., TD 2,521 ft. 2 wells (Rosiclare only) at year end.

NOBLE, WEST—Clay, October; J. H. Gilliam 1 Chester Jones, NE SE NW 3-3n-8e, 42 bbl., Rosiclare, 3,036-42 ft., TD 3,143 ft.

OKAWVILLE—Washington, May; E. A. Oberling 1 Baldwin, NE SE SE 15-1s-4w, 56 bbl., Devonian-Silurian, 2,329-36 ft., TD 2,336 ft. 3 wells at year end.

OMAHA, SOUTH—Gallatin, October; Inland Producers 1 Allen, SE NW SW 8-8s-8e, 34 bbl., O'Hara, 2,866-68 ft., TD 3,017 ft.

OSKALOOSA, EAST—Clay, July; National Associated Petroleum Co. 1-A Spiker-Sefton, 380 ft. from SL x 330 ft. from WL SW SW (SW SW SW) 7-3n-6e, 297 bbl., McClosky, 2,894-98 ft., TD 2,898 ft. 2 wells at year end.

PANA—Christian, May; Collins Brothers 1 R. T. Jones, NE NE NE 3-11n-1e, 20 bbl., Bethel (Benoist), 1,472-82 ft., TD 2,847 ft. 2 wells at year end.

PHILLIPSTOWN, SOUTH—White, October; Aubrey-Tennant Oil Co. 1 S. L. Brown, NW SW SW 11-5s-10e, 30 bbl., Aux Vases, 2,981-94 ft., TD 2,994 ft.

PINKSTAFF—Lawrence, May; Cherry & Beebe 1 W. E. Conrad, SE SW NW 9-4n-11w, 15 bbl., McClosky, 1,734-38 ft., TD 1,797 ft.

RITTER, NORTH—Richland, November; Sanders & Fye 1 Phillips, NE NE SW 18-3n-11e, 52 bbl., McClosky, 3,201-08 ft., TD 3,288 ft.

SAMSVILLE, WEST—Edwards, December; Peak Drilling Co. 1 E. King, SW SE SW 27-1n-10e, 200 bbl., O'Hara, 3,266-72 ft., TD 3,312 ft.

SCHNELL, SOUTH—Clay, September; Clavert Drilling, Inc., 1 E. Gallagher, NE NW SE 13-2n-8e, 85 bbl., Rosiclare, 3,003-08 ft., TD 3,071 ft. 2 wells at year end.

SUMPTER, EAST—White, December; George & Wrather 1 Reuben Winter, SW NW NW 32-4s-10e, 300 bbl., O'Hara 3,118-25 ft., TD 3,265 ft.

WALPOLE, SOUTH—Hamilton, June; Dee Miller 1 H. E. Howard, SE SW NE 8-7s-6e, 350 bbl., Aux Vases, 3,124-31 ft., TD 3,133 ft. 2 wells at year end.

XENIA, EAST—Clay, July; W. W. Dayton 1 G. G. Campbell, SE NW SE 11-2n-5e, 45 bbl., Cypress, 2,505-11 ft., TD 2,535 ft. 4 wells at year end.

NEW PAYS

BELMONT—Wabash, July; George Ellison 1 Fisher Heirs, SE NE NE 36-1s-14w, 24 bbl., Bethel, 2,652-56 ft., TD 2,935 ft.

ELLERY, WEST—Wayne, January; Illinois Mid-Continent Co. 1 Jones-Kendall, 400 ft. from SL and 330 ft. from WL SE (SW SW SE) 23-2s-9e, 108 bbl., Bethel (Benoist), 3,109-17 ft., TD 3,395 ft. 16 wells (Bethel) at year end.

ELLERY, WEST—Wayne, April; Skiles Oil Corp. 1 E. H. O'Daniel, NW SW NE 26-2s-9e, 50 bbl., Bethel, 3,104-13 ft. and Aux Vases, 3,230-38 ft., TD 3,238 ft. 2 wells (Aux Vases) at year end.

EPWORTH—White, June; George & Wrather 1 Hanna, NE SE NE 32-5s-10e, 49 bbl., Pennsylvanian, 1,844-54 ft., TD 3,067 ft. 3 wells at year end.

FROGTOWN, NORTH—Clinton, April; E. J. Goldschmidt 1 Jaske Community, 100 ft. from NL and 330 ft. from EL NE SE 1-2n-4w, 440 bbl., Devonian-Silurian, 2,267-85 ft., TD 2,285 ft. 17 wells at year end.

GOSSETT—White, June; H. Atha 1 M. Delap, SE SW NW 8-7s-8e, 35 bbl., Cypress, 2,625-44 ft., TD 2,644 ft.

GOSSETT—White, June; H. D. Atha 1 Rabe Shaw, NW SW NE 17-7s-8e, 20 bbl., Aux Vases, 2,955-73 ft., TD 2,973 ft.

HALF MOON—Wayne, November; Collins Brothers 2-B Mabee, NE SE SE 28-1s-9e, 9 bbl., Aux Vases, 3,190-3,210 ft., TD 3,310 ft.

HERALD—White, October; A. J. Slagter, Jr., 1-A Silas Bayley, 500 ft. from NL and 330 ft. from WL SW NW (S/2 SW SW NW) 2-7s-9e, 1,600,000 cu. ft. of gas, Pennsylvanian, 694-697 ft., TD 697 ft.

KENNSBURG, SOUTH—Wabash, April; White & Vickery 1 Garst, SE SE SW 27-

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2s-13w, 360 bbl., Cypress, 2,404-16 ft., TD 2,416 ft. 3 wells at year end.

LANGENWISCH-KUESTER—Marion, November; W. C. Wellman 1 Langewisch, NE SW NE 4-1n-1e, 2 bbl., Pennsylvanian, 798-804 ft., TD 824 ft.

LOCUST GROVE—Wayne, March; J. W. Rudy 1 C. Denny-Bunting, NW SE NW 32-1n-9e, 54 bbl., Aux Vases, 3,218-29 ft., TD 3,229 ft. 3 wells at year end.

LONG BRANCH—Saline, September; Cullum & Lawhead 1 J. J. Ellis, SE NE NE 20-7s-6e, 80 bbl., Cypress, 2,749-66 ft., TD 2,766 ft. 2 wells at year end.

LOUDEN—Fayette, October; Carter Oil Co. 1-G J. B. Dries, 100 ft. from NL on WL SE NW 22-8n-3e, 200,000 cu. ft. of gas, Tar Springs, 1,103-07 ft., TD 1,107 ft. 3 wells at year end.

MASON—Effingham, August; H. Luttrell 2 C. J. Moritz, NW SE NW 23-6n-5e, 60 bbl., Bethel, 2,296-2,304 ft., TD 2,304 ft.

MASON, NORTH—Effingham, September; The Texas Co. 2 R. Sinnickson, SW SW NW 10-6n-5e, 100 bbl., Bethel, 2,247-59 ft., TD 2,504 ft. 7 wells at year end.

ORCHARDVILLE—Wayne, March; Collins Brothers 1 Rutherford Heirs, SE NE SE 29-1n-5e, 29 bbl., Aux Vases, 2,974-79 ft., TD 2,808 ft.

RACCOON LAKE—Marion, October; The Texas Co. 10 Clara, 450 ft. from SL and 435 ft. from EL NW SE 3-1n-1e, 109 bbl., Devonian, 3,260-53 ft., TD 3,385 ft.

SUMPTER—White, September; Kingwood Oil Co. et al 1 R. J. Winter, SW NW SE 25-4s-9e, 7 bbl., Hardingsburg, 2,655-69 ft., TD 3,325 ft.

MICHIGAN

NEW POOLS

CROTON—Newaygo, June; Augie Busk 1 Hatchew et al., SE SW NW 29-12n-11w, Traverse, 2,551-53 ft., 50 bbl. of oil, TD 2,553 ft. 3 wells at year end.

EDWARDS—Ogemaw, February; Basin Oil Co. 1 Winter, NE NE SW 15-21n-1e, Dundee, 3,662-72 ft., 60 bbl. oil, TD 3,375 ft.

EGELSTON—Muskegon, January; Avalon Oil Co. 1 Hartley, NW NE NW 15-10n-15w, Berea, 1,120-22 ft., 310 M.c.f. of gas, TD 1,892 ft. 5 wells at year end.

JOHNSTOWN—Barry, August; Universal Drilling Co. 1 Fry, SW NE NE 17-1n-8w, Johnstown Twp., Traverse, 1,857-68 ft., 5 bbl. oil, TD 1,899 ft. 2 wells at year end.

MINERAL SPRINGS—Osceola, April; Mogul Oil Co. 1 Hammer, SW SW NE 20-20n-9w, Dundee, 3,862-70 ft., 50 bbl. oil, TD 3,872 ft. 4 wells at year end.

SANFORD—Midland, February; Michigan Oil Co. 1 State-Jerome, NW SW NE 13-15n-1w, Dundee, 3,755-58 ft., 28 bbl. oil, TD 3,820 ft.

SHELBY—Oceana, March; Gulf Refining Co. 1 Ruckel, NE SW NW 18-14n-18w, Traverse, 1,738-60 ft., 185 bbl. oil, TD 1,763 ft. 3 wells at year end.

SPRINGFIELD—Kalkaska, May; Taggart Bros. Gas Co. S-2 Consumers Paper Co., C NW 35-25n-8w, Traverse, 2,356-60 ft., 540 M.c.f. of gas, TD 2,373 ft.

STANTON—Montcalm, May; W. R. Swetland 1 Carlson, SE SE SW 26-11n-7w, Traverse, 2,969-74 ft., 92 bbl. of oil, TD 3,492 ft. 4 wells at year end.

UNNAMED—Allegan, July; Ford Oil Co. 1 Slotman, SE SW SE 20-3n-14w, Heath Twp., Traverse, 1,402-04 ft., 2 bbl. of oil, TD 1,404 ft.

UNNAMED—Allegan, December; Ray Jones 1 Gordon, NE NW NW 36-3n-12w, Traverse, 1,634-41 ft., 12 bbl. oil, TD 1,641 ft.

UNNAMED—Bay, June; J. O. Mutch 1 Demaray, SW SE SW 20-18n-3e, Dundee, 3,090-3,126 ft., 8 bbl. oil, TD 3,157 ft. 2 wells at year end.

UNNAMED—Mecosta, March; Mercer Oil Co. and Smith Petroleum Co. 1 Soper, NW SW SW 13-16n-10w, Dundee-Monroe, 3,531-39, 3,660-61 and 3,674-76 ft., 225 M.c.f. of gas, TD 3,731 ft.

UNNAMED—Mecosta, December; McClure Oil Co. et al. 1 Adair, SE SE NW 13-16n-10w, Traverse, 2,998-99 ft., 75 bbl. oil, TD 2,999 ft.

UNNAMED—Montcalm, May; Moco 1 Allen, SW NE SE 9-11n-8w, stray sand, 1,251-53 ft., 2,110 M.c.f. of gas, TD 1,253 ft.

UNNAMED—Newaygo, October; McClure Oil Co. 1 Johnson, NW SE NW 25-12n-14w, Traverse, 2,202-05 ft., 45 bbl. of fluid, TD 2,205 ft.

NEW PAYS

BRANCH, WEST—Ogemaw, December; O. K. West 1 State-Mills, SW SW NW 6-21n-3e, Detroit River (sour zone), 3,579-3,616 ft., est. 25 bbl. of oil, TD 3,642 ft.

CRANBERRY LAKE—Clare, December; Louis Rose 1 Brocht, N/2 NE SE 2-20n-6w, Richfield, 5,049-54 ft., est. 40 bbl. of oil, TD 5,056 ft.

CROTON—Newaygo, August; Augie Busk 1 Hatchew Community, E/2 SW NW 29-12n-11w, Marshall, 917-19 ft., 1,700 M.c.f. of gas, TD 919 ft.

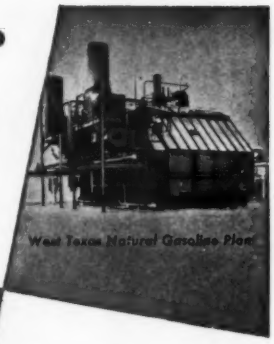
HEADQUARTERS—Roscommon, December; E. V. Hilliard R. L. 1 State-Roscommon, N/2 SE SW 29-21n-3w, Richfield, 5,147-5,238 ft., est. 20 bbl. of oil and 50 bbl. of water, TD 5,346 ft.

MEARS—Oceana, April; McClure Oil Co. 1 Forestry Association, NE NE SW 35-15n-18w, Traverse, 1,742-46 ft., 50 bbl. of oil, TD 1,746 ft.

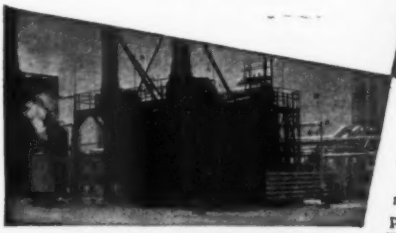
PARIS—Mecosta, January; Cities Service Oil Co. 1 McFarlane, SE NW SE 21-16n-10w, stray sand, 1,217-23 ft., 1,540 M.c.f. of gas, TD 3,493 ft., PBTD 1,222 ft.

WICKES

STEAM GENERATORS SPEED PROCESSING AND CUT COSTS IN REFINERIES AND NATURAL GASOLINE PLANTS



West Texas Natural Gasoline Plant



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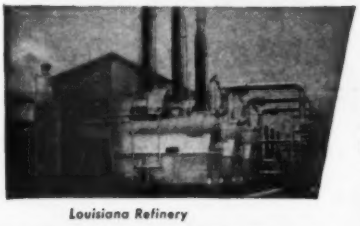

Louisiana Refinery

Indiana Installation

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BOOKS

HELIUM-BEARING NATURAL GASES OF THE UNITED STATES. By C. C. Anderson and H. H. Hinson. Bulletin 486, of the U. S. Bureau of Mines. Published by Government Printing Office. 141 pp. 70 cents.

The results of a Bureau of Mines survey of helium resources are given in this report and comprise gas analyses and accompanying data on more than 2,100 samples that have been collected in 30 states. The survey to determine the nation's helium resources has been carried on in all natural-gas-producing areas of the United States since the inception of the Government's helium program in 1917.

Outstanding in the field . . .

Last 20 to 50 times as long*—save hundreds of dollars on string pulling cost

The ball and seat is now available that defies corrosion, and has no equal in wearing qualities. Yes, it's a "Super" ball and seat that gives outstanding performance under any and all conditions. It has a hardness of 80 Rockwell C, or approximately the same hardness as sapphire, yet pounding will not faze it.

Kennametal balls and seats combat corrosion, sand cutting, or pitting even under the worst fluid pumping conditions. More than 100,000 sets in the field are proof of this fact.

One operator in the mid-continent field reports: "We installed Kennametal balls and seats and had received 22.5 longer service from them when the pump was pulled for inspection. The same Kennametal ball and seat had been in service for 448 days. Our best service with the other ball and seat was 20 days." (A fluid with a heavy sand content was pumped.) He continued that the Kennametal ball and seat was as good as new at the time of inspection and it was reinstalled. At last report it was still operating. This is one example of how Kennametal balls and seats help operators everywhere to reduce string pulling cost, and production delays.

Your supplier will gladly give you particulars the next time you replace your check valves.

* *As shown by actual field operating conditions comparing Kennametal and high quality alloy steel balls and seats. Moreover, the ratio of 20 to 1 is indicated as conservative and reports show some oil producers to obtain as much as 50 times longer service.*

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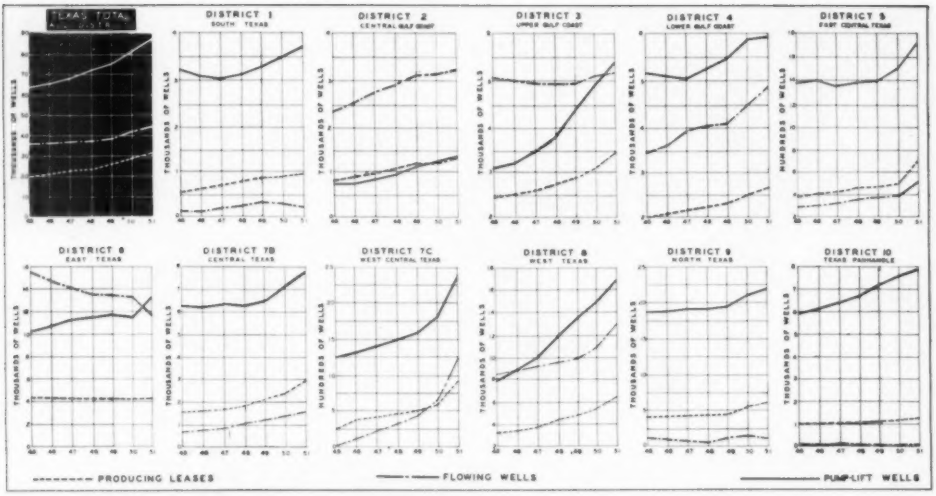
KENNAMETAL Inc., Latrobe, Pa.

Put an end to down-the-hole check valve trouble



25,554 Artificial-Lift Wells Seen for '52

Texas will have nearly one-half of these installations, with Oklahoma in second place

by Joseph A. Kornfeld

FOR the year 1952 The Oil and Gas Journal estimates that 25,554 wells will be placed on artificial lift. This represents a substantial gain over last year when the Journal survey indicated a total of 23,646.

Included in this survey of artificial-lift installations are sucker-rod pumping, hydraulic pumping, plunger lift, gas lift, electrical submersible-pump installations, and the like.

Nearly one-half of these units will be installed in Texas which leads the nation with 10,472 wells to be placed on artificial-lift and pumping well schedules. West Texas and North Texas will claim the bulk of these new units. Spraberry trend completions will go on the pump relatively fast in contrast to the long flowing life of the deep Ellenburger and Devonian reservoirs in the Midland basin.

Gulf Coast fields.—The long flowing life of the Tertiary sands is characteristic of the Gulf Coast. Mississippi's Cretaceous and Eocene reservoirs will require 242 new lift units this year. Louisiana will need 1,300 new lift units shared between the Tertiary coastal areas and the shallower North Louisiana fields.

Mid-Continent areas. — Oklahoma will be second with 3,330 new artificial lift wells, principally in the eastern older half of the state. The 2,076 new lift wells for Kansas will be shared between secondary-recovery operations in the eastern half and the Lansing and Arbuckle development on the Central Kansas uplift.

California will be fourth with 1,940 wells.

Rocky Mountains. — Greatest concentration of new lift installations in the Rocky Mountain province will be in Wyoming with 434 wells to be placed on lift. Montana's older fields will require 166 new pump units in 1952. However, in the Williston basin, the new Mississippian and Devonian reservoirs are expected to exhibit a long flowing life; consequently, few lift installations are contemplated during the year in eastern Montana and in North Dakota.

Development of the Dakota-Graneros sands in the Denver-Julesburg basin is featured by a high percentage of wells going on the pump on initial completion. Thus in Nebraska, 135 new units will be installed; Colorado will have 136 new units, principally in the eastern half of the state.

East of Mississippi. — Continuation of the present activity in secondary-recovery methods for increasing ultimate recoveries and oil-production rates is evident in the older producing areas, principally in the Illinois basin and the Appalachian fields. In Illinois, 1,380 artificial-lift units will be installed. Indiana will have 640 new units and Kentucky 518 new pumping wells. Michigan will gain 385 new lift wells.

In the Appalachian fields, 958 new pumping units will be installed in Pennsylvania, 324 in New York, 129 in West Virginia, and 339 in Ohio.

The accompanying chart displays the past 7-year trend as to number of producing leases, number of flowing wells, and a number of pump-lift wells for Texas as a whole and by individual Railroad Commission districts.

ARTIFICIAL LIFT SURVEY, 1952
Estimates for 1952

	To be drilled	Artificial lift
Arkansas	438	237
California	2,418	1,940
Colorado	320	136
Illinois	2,279	1,380
Indiana	1,281	640
Kansas	4,327	2,076
Kentucky	1,296	518
Louisiana	2,341	1,300
Michigan	711	385
Mississippi	387	242
Montana	319	166
Nebraska	269	135
New Mexico	988	326
New York	648	324
Ohio	968	339
Oklahoma	5,842	3,330
Pennsylvania	1,915	958
Texas	16,997	10,472
West Virginia	647	129
Wyoming	723	434
Others	332	87
Total U. S.	45,446	25,554

BARTON FLOWMETERS!

here's proof...

A user reports this test made on a BARTON Flowmeter with a 25" W.C. differential range at a pressure level of 1200 psi:

A 300 psi over-range pressure was alternately applied in the normal direction and then in the reverse direction approximately *20 times a minute*, continuously—day and night—*for three weeks!* At the conclusion of the test—after more than one-half million differential over-ranges in each direction—the instrument was checked for zero and calibration; *it had changed* less than one per cent! AND *no maintenance or parts replacement was required!*

less maintenance...

ALL MAJOR SOURCES OF TROUBLE inherent in other differential-pressure meters ARE ELIMINATED IN BARTON Rupture-Proof FLOWMETERS!

NO LIQUID SEALS TO LOSE—corrosive and volatile liquids are handled without seal pots, thus reducing installation and upkeep costs.

NO MERCURY USED—hence, no costly losses due to leakage or theft, and no contamination of liquid being handled. Likewise, installation can be made without accurate leveling.

EASY TO OPERATE—Unskilled personnel can put a BARTON in operation without danger of damage to the meter.

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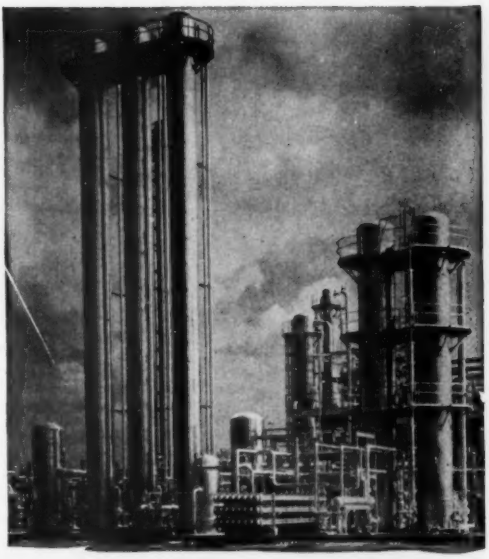

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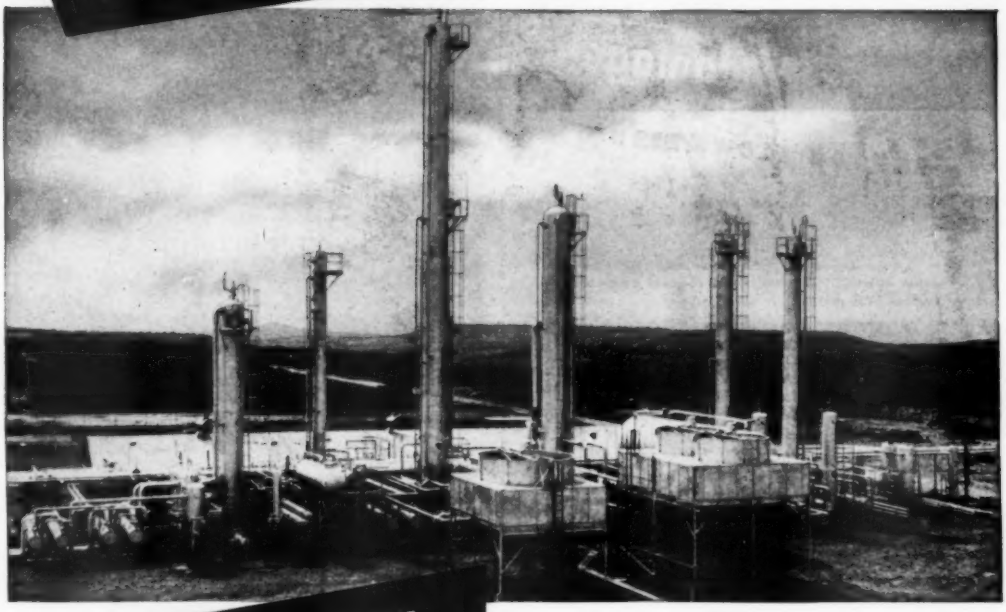

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QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Application of Fluidization To Chemical Operations

Has fluidization been applied to chemical manufacture, and if so will you please list references? R. C. M.

Catalytic cracking by the fluidization catalyst method as developed by Standard Oil Development Co. during World War II was heralded by some as the greatest war development of the petroleum industry. In part, it has upheld this prophetic claim, and it is believed that its full usefulness has not yet been explored. An obvious disadvantage to rapid development or application is the fact that somewhat large capacities are required in order to justify the application of fluidization.

Fluidization involves the supporting of a finely divided solid by the passage of a gas through the powdered solid. Thus, the particles of solid material are suspended in the gas stream, the larger particles tending to fall or accumulate at the bottom, and the smallest particles tending to escape with the gas. The solid may be (1) a catalyst as in the oxidation of naphthalene into phthalic anhydride, (2) an adsorptive catalyst as in catalytic cracking, (3) a solid that contains combustible materials as in pyritic (sulfur) ore, or spent cracking catalyst with its coke, (4) solids that are heated by the burning of a fuel in the fluidized bed as in calcining calcium carbonate, (5) a solid that is partly burned as in the devolatization of coal or oil shale, (6) a solid that contains vaporizable material as moisture in ore, or decomposable material as the oil in oil sands, (7) solids that are fluidized simply for ease of transporting as in dry fire-fighting systems, and finally (8) the use of a fluidized bed to entrap or filter mists, dusts, or smokes from gases. It might be applied purely as a method of delivering heat in a manner similar to that employed in so-called pebble heaters.

The application of fluidization is most likely to be advantageous when one or more of the following features causes a conspicuous improvement:

1. Improved temperature control.—(a) preventing undesirable side reactions, (b) preventing losses of raw materials as by sintering of residues, ashes, etc., (c) improving the quality or uniformity of product.

2. Improved heat transfer.—(a) increasing capacity or size of units, (b) reducing external temperatures on tubes or vessels, (c) replacing external heating by a thermophore (heat-carrying medium).

3. Increased reaction rates. — (a) lowering reaction temperatures, (b) increasing the capacity of units.

This summary largely by Kalbach[16] can be supplemented by other excellent summaries or discussions by Hall[13] and Kite and Roberts.[15]

Space is not available here to explore all of the numerous operations that are employing fluidization or for which this operation has been proposed, but the following is a list of such applications:

1. Fluid catalytic cracking.[20 21] This original process development converts distilled petroleum charge stocks into high-octane gasoline (79-81 motor method), somewhat large yields of gas rich in C_3 and C_4 hydrocarbons, a somewhat inferior cycle stock ranging up to about 40 per cent, a carbonaceous deposit which is burned from the catalyst supplying most of the heat for the process, and substantially no heavy or No. 6 grade of fuel oil. The great success of the process arises from the elimination of heavy fuel, the large yield of useful gases, and the octane number of the gasoline product.

2. Hydroforming.[1] Low-octane gasoline is reformed into high octane gasoline, or selected C_6-C_7 charge stocks are converted into toluene by the action of a catalyst in the presence of hydrogen. Fluidization operations have only recently become commercially significant.[22 23]

3. Fischer-Tropsch.[11 12 14 15] The German fixed-bed Fischer-Tropsch process of 1926-1933 employed an expensive cobalt catalyst. Steel mill scale (iron oxide) promoted with alkali is used in the Brownsville, Tex., plant of Carthage Hydrocol Corp., which employs fluidization. The oxide is subsequently reduced to metallic iron. Carbon monoxide and hydrogen are converted into liquid products. Internal cooling tubes are used in the reactor to remove the very large heat of reaction.

4. Dry hydrogenation of coal.[2 17] The Bergius I.G. process of coal hydrogenation employs a residual-oil slurry as a means of handling the catalyst. The use of a dry (fluidization) process is said to permit lower pressures than the conventional process.

5. Coal devolatization.[19 5] Coal is devolatized by burning part of it. This results in a gas product, eliminates much of the sulfur into the gas, and produces a smokeless char that may be burned directly while hot in power plants or in the form of briquettes.

6. Oil-sand distillation.[1] The enormous deposits of Athabaska bituminous oil sand of Alberta, Canada, have long awaited an economical method of processing. Lumps of oil sand when introduced into a 900° F. bed of fluidized sand, disintegrate into dry sand and the layer of oil on the sand particles distills. The layer of coke left on the sand grains supplies enough heat for the process. Oil sand is fed continuously into the fluidized bed, and oil and spent sand are continuously removed.

7. Oil-shale distillation.[1 10] Likewise oil shale is being fed into a fluidized bed at a temperature of 700°-1,000° F. in an attempt to avoid the difficulties of handling the large bulk of ash or stone found in oil shale.

8. Carbon gasification.[6 12] The production of producer gas by the reaction of carbon dioxide with carbon has been investigated and likewise the production of water gas by the reaction of steam with a fluidized bed of carbon.

9. Oxidation of methane.[1] A catalyst of copper oxide supported on silica gel has been used to oxidize methane into carbon monoxide and hydrogen, the gaseous feed that is synthesized into liquid products by the Fisher-Tropsch process.

10. Calcining.[1 12 15] Calcium carbonate either in the form of crystallized limestone, lime sludge (precipitate) or lime pellets, has been accomplished in a fluidized bed. Heat is applied by the burning of a fuel such as Grade A.S.T.M. No. 6. It has been possible to calcine the dolomitic portion of the feed without calcining the calcium carbonate part.

11. Phthalic anhydride manufacture.[10 12] Oxidation of naphthalene into phthalic anhydride was perhaps the first commercial application of a purely chemical nature. A better yield is claimed than by the older conventional German process which involves the use of vanadium pentoxide as a catalyst.

12. Roasting.[1 15] The roasting of pyrites in a fluidized bed is said to be so successful that 40 units are now on order. They will replace the older rabbled-type roaster and are said to produce a 15 per cent sulfur dioxide gas from a 48 per cent pyritic ore. Likewise, arseno-pyrite or pyrite gold ores have been roasted as a preparatory step to the conventional cyanide process of gold recovery. Heat is supplied by the burning of a fuel.

13. Dryer sizer combination.[1 9] Dolomite stone has been dried by introducing it into a hot fluidized bed of the material. Meanwhile, fines are eliminated through the cyclones and coarse materials settle to the bottom for removal. Heat is supplied by burning Grade No. 2 A.S.T.M. fuel oil.

14. Removal of mists or dusts.[4] Glass beads, silica, silica gel, or alumina have been fluidized by a stream of gas containing sulfuric acid mist or ammonium nitrate smoke. The more

porous solids are said to effectively remove the dust, smoke, or mist.

15. Fire-fighting system. Dry chemical has been fluidized with nitrogen gas and then transported in pipe lines to the point of need.

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BOOKS

SECOND SYMPOSIUM ON SUBSURFACE GEOLOGICAL TECHNIQUES. Edited by Carl A. Moore, Department of Geology, University of Oklahoma. Distributed by the University Book Exchange, Norman, Okla.

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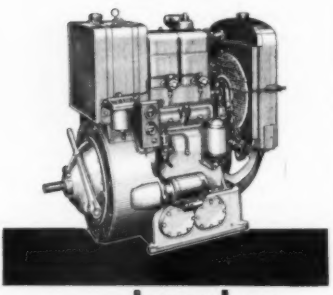

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CORROSION and its control

Metal Linings for Corrosion Resistance

ONE of the effective methods of combating corrosion in refinery vessels is the use of materials whose resistance to the particular set of conditions is higher than that of steel. While it is often simpler to make small components, such as valves and fittings, entirely of the more expensive metal or alloy, large vessels are frequently merely lined with the material in sheet form. This type of construction may be adopted for reasons of economy, or to adapt an existing vessel to a new process, or to meet conditions more severe than had been anticipated, or to make possible the use of a material which has the desired corrosion resistance, but is deficient in the structural strength required.

Leaving out the use of alloy for the entire vessel, there are four general methods whereby a surface of resistant alloy may be exposed to the corrosive fluids: by the use of clad metal, which is bonded throughout before fabrication; by the deposition of weld metal over the entire interior surface; by the metal spraying process; and by the use of sheet lining material. Only the last-named will be discussed here.

There are various factors which act to determine the best technique of application of liners. The size of sheet available, and the size of the vessel openings through which the sheets must be taken will often determine the maximum unit of application. The structural strength of the material being used will obviously influence the number and distribution of points or areas of support. Possible differences in the expansion of the lining metal and the vessel wall under the temperature range to be encountered must also be considered.

Four methods of attachment by welding are in use. The oldest of these, the so-called "plug" method, is rarely used any more. This technique consists of cutting or punching a number of holes in the sheets—perhaps 1 in. in diameter, spaced on 4-in. centers—and welding the inner edge of each hole. The entire hole is then filled up with weld metal, so as to cover the base metal completely. It is obvious that this calls for a refined welding technique, and that contamination with the base metal is inevitable. In the case of ferrous alloys, such as stainless steels, this contamination may not be serious; it can be minimized by using a welding electrode of a higher alloy, but the danger will always remain of enough difference in constitution between the weld metal and the sheet itself to give rise to galvanic action. When the lining material is nonferrous, there is no way to compensate for the contamination.

Contamination Possibility

A second method is that of applying strips of the lining material, each with a fillet weld on all edges, the adjacent strips having a slight gap left between them. This gap is bridged over with a wide filler bead as a finishing process. The possibility of some contamination is present with this type also, but under many conditions it may be tolerated when using ferrous linings, for the reasons discussed above.

If contamination is to be avoided entirely, it is possible to apply strips with a shingle lap, each strip lapping from 2 to 4 in. over the preceding, so that every weld exposed to the fluids is a weld involving two sheets of lining material only. Another advantage of this method—of considerable importance when lining is being applied to an existing vessel—is that the fit of the sheets does not have to be exact, since the amount of overlap obtained is not critical.

The shingle-lapped strip method may be modified without any significant change in characteristics to a double-lapped strip. In this variation, a set of strips is installed with spaces left between, each space being narrower than a strip by the width of two laps. Then the second set of strips is applied over the spaces, all of the welds being made on lining metal only. It can be seen that this does not differ materially from the shingle-lap except in the order of application. It may, however, make possible the saving of some time and labor by this difference in order; the crew which sets the strips in place will have to change places with the welders only twice, which can save quite a bit of time, particularly in a small vessel. It may also be helpful to the welder to have a long series of similar welds to make.

The support of lining materials with very low inherent strength—such as lead—offers some special problems. Usually lead-lined equipment is originally designed as such, so the problem of installing lead in existing vessels is rarely encountered. If the vertical dimension is very great, horizontal supports in the form of ledges must be provided. Often lead linings are held in place with lead-covered bolts, or with bolts the heads of which are covered with lead pads after erection.

Stud welding, particularly since the development of special stud-welding machines and techniques, offers still another means of attachment of linings. The studs, surrounded by an insulating sleeve, are inserted through holes in the vessel wall and welded to the lining as it is held in position. The studs may then be secured with nuts, or (the sleeves being omitted) may be welded to the outer wall of the vessel. When the bolted connection is used, an insulating washer should be used under the nut; this, in conjunction with the insulating sleeve, helps to avoid galvanic corrosion at the junction of the dissimilar metals, when the exposure involves a moist atmosphere. However, adequate maintenance and good painting can usually avert trouble of this nature.

Part 44 of a series by Marshall E. Parker, consulting engineer, Houston.

Heat-Exchanger Maintenance . . . *It's largely a matter of cleaning*

by J. H. Fitzpatrick*

Here's a practical discussion of the four principal methods of cleaning, and when and how each should be used for best results

ONE of the most important functions in present-day maintenance, is that of heat-exchange equipment. In all plant operations, whether it be in a refinery with hundreds of units in operation, whether it be in the average industrial plant or in private and public utility, the need for planned maintenance is essential to realize the maximum heat-transfer rate which naturally increases output because higher capacities can be realized from the greater rate of that heat transfer.

Heat-exchange equipment for the purpose of this discussion refers generally to tubular equipment and classified as shell-and-tube exchangers, kettle elements, overhead condensers, surface condensers, vaporizers, and cooling-tower coil sections. In using the term "heat-exchange maintenance" one naturally thinks of the cleaning of equipment and which is directly the purpose of this discussion.

Cleaning Methods

To determine the proper method for cleaning, it is necessary to take into consideration various factors which include:

Type of deposit.

Over-all time required for the job or the allowable outage time.

Cost.

Types of deposits.—These may be broken down into three classifications according to their detrimental effect on heat surfaces, as follows:

1. Hard; formed by water scales, corrosion products, rust, hard coke, etc.

2. Porous; formed by mud and dirt precipitated out from water or oil, coke or carbon, asphalt, or other like substances.

3. Loose; formed by mud and silt, soot, powdered coke, vegetable matter, polymers, slimes, and other process fluids.

The loose deposits have been considered to be the most detrimental to heat transfer due to the fact that the character of the deposits will change with age and the temperature to which they are subjected. For this reason a universal cleaning procedure has never been perfected.

*International Cementers, Inc. Presented at twenty-sixth annual fall meeting, C.N.G.A., Los Angeles, 1951.

The different ways to clean exchangers are:

1. Chemical.
2. Wet sandblast.
3. Dry sandblast.
4. Mechanical and miscellaneous, including (a) turbining—dry or with water or solvent; (b) high-pressure steam; (c) ovens; (d) drilling.

Chemical cleaning.—In the last few years this method has become a major maintenance tool due largely to accessibility of the cleaning fluid to all parts of a unit, the outage time involved when cleaning a large vessel or group of vessels, and the actual dollar-and-cent cost when compared to outage time and man-hours for maintenance. Twenty or more units may be as easily cleaned as one, with only the additional time required for the filling of the units which would be negligible.

Chemical cleaning should never be attempted accept by trained personnel familiar with the use of chemicals. The first step in chemical cleaning is the analysis of the scale. Following analysis, the cleaning procedure, including chemicals, additives, intensifiers, and wetting agent required, optimum cleaning temperatures, and time required is fully developed. Then and only then should a unit be chemically cleaned and by trained personnel only. It should be pointed out that it is not necessary to remove the tube bundle or disturb the unit to effect a chemical cleaning.

Wet sandblasting.—When scales are insoluble or have limited solubility this method has been found effective. Cleaning is accomplished by jetting with high-pressure water or with high-pressure water and abrasives. Aspirating nozzles which discharge aerated water to remove soft to medium hard deposits and aerated water plus abrasives for harder deposits are available. Of course, this method requires power pumps for the desired pressure, various type nozzles to obtain the desired impingement of water, or water and abrasives, on the surface to be cleaned. However, high-pressure water cannot be used safely without proper precautions and protective clothing which includes rubber suit and face protector. Precautions to be taken include: when more than one man is working on a bundle, they work from same side; cleaning area isolated to prevent entry by other persons; pump operator in sight of nozzle man, or in contact by sound-powered phone or signal man.

Dry sandblasting.—This method is used on the tube side of bundles when extremely hard deposits are encountered. Blasting time is held to the minimum necessary for complete removal of deposits. Here again the necessity is shown for trained personnel to properly handle the nozzle to minimize loss of metal due to impingement of abrasive against metal surface. Equipment, isolation and precautions are necessary as with wet blasting.

Where several heat exchangers are employed and the problem of maintenance is before us, emphasis must be placed on the cleaning facilities. A centralized location to permit the handling of various types of bundles and shells to accomplish the efficient removal of the numerous types of scales encountered should include both wet and dry blast cleaning cells with automotive and crane facilities to permit rapid movement of the bundles from the operating unit area to the cleaning equipment. Regardless of the type of cleaning, it is well to bear in mind the type of deposit, time required, and the cost.

Not long ago, one large company had a problem which involved a scale, limited outage time, and a budget. The unit in question was the fourth point extraction heater taking exhaust from the low-pressure stage of a main turbine. Exhaustive daily readings, recorded over a period of months, showed greater and greater terminal differences which indicated that apparently a scale condition was preventing proper heat transfer. The vertical heater with bottom floating head was totally enclosed in an expensive job of insulation. Power demands prevented down time except for a short period and the maintenance department working on a budget had only so much money to spend.

The cleaning job was solved by using a chemical wash on a scale which was known to be soluble. Total down time for the job was 16 hours and well within permissible limits. Cost for the operation was far below that which was allowed and paid off in 20 days by the savings effected.

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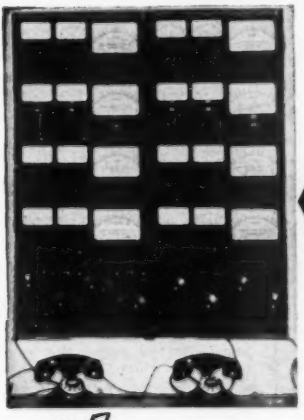

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FORM 533 — EBASCO SERVICES INCORPORATED
SOIL RESISTIVITY

FOR Rochester Gas & Electric Corporation COMPANY — D S # 72

TOWN Rochester, N.Y. - Soil Tests for Rectifier Vicinity — DATE October 27, 1950
Brighton Country Club on 14" Cabot Line. — BY J.V. Adkin, A.W. Peabody

NO.	LOCATION	DEPTH FEET	Δ I MA	Δ V MV	MV/MA	MULTIPLIER K	RES. - OHM CM A PIN	RES. - OHM CM SOIL BOX
25.	Same as 24 except 100' further	2.5	39.5	179	4.53	500	2,265	
	SW along edge of field and bank of	5	48.5	130	2.68	1000	2,680	
	creek.	7.5	46.8	113	2.27	1500	3,405	
		10	47	105	2.23	2000	4,460	
		15	44.2	96.5	2.18	3000	6,540	
	CANES 5000-10,000+ DEPTH 6"							
26.	Same as 25 except 100' further	2.5	22.4	194	8.68	500	4,340	
	SW along edge of field and bank of	5	34.2	147	4.3	1000	4,300	
	creek.	7.5	31.0	103	3.33	1500	4,995	
		10	29.8	86.5	2.9	2000	5,800	
		15	27.3	74	2.71	3000	8,130	
	CANES 7000-10,000 DEPTH 6"							
27.	Same as 26 except 100' further	2.5	20.5	184	8.98	500	4,490	
	SW along edge of field and bank of	5	18.8	95	5.05	1000	5,050	
	stream.	7.5	25	109	4.36	1500	6,540	
		10	24.5	91	3.71	2000	7,420	
	V.T.M. ● HIGH - LOW	15	23.5	79	3.36	3000	10,080	
	CANES 8000-10,000 + DEPTH 6"							
28.	Same as 27 except 100' further	2.5	23.2	180	7.75	500	3,875	
	SW along edge of field and bank of	5	42.5	190	4.46	1000	4,460	
	stream.	7.5	45.0	176	3.78	1500	5,670	
		10	38.5	171	3.4	2000	6,800	
		15	37.8	121	3.2	3000	9,600	
	CANES 8000 DEPTH 6"							
29.	Same as 28 except 100' further	2.5	20.5	187	9.12	500	4,560	
	W along edge of field. Cutting	5	32.5	148	4.55	1000	4,550	
	away from creek and going slightly	7.5	32.8	102	3.12	1500	4,680	
	up-grade.	10	32.4	90	2.78	2000	5,560	
		15	29.9	71	2.38	3000	7,140	
	CANES 7000-10,000 + DEPTH 6"							
30.	Same as 29 except 100' further	2.5	37.5	181	4.83	500	2,415	
	W. along edge of field (approx.opp.	5	49	140	2.85	1000	2,850	
	side of test 19 but about 800' S.	7.5	38	138	2.35	1500	3,525	
		10	56.2	124	2.2	2000	4,400	
		15	40.5	79	1.95	3000	5,850	
	CANES 3000-10,000+ DEPTH 6"							

Chart of soil-resistivity test readings.

Graphite Ground Anodes Protect High-Pressure Gas Lines

by A. W. Peabody*

There is a sincere belief on the part of many people that the northeastern section of the United States is immune to underground corrosion. That this conception is faulty has been discovered, at great cost, by many municipalities and industries. The utilization of cathodic protection is illustrated by the experience of Rochester Gas & Electric Corp. which installed a ground anode system to protect its high-pressure natural-gas supply line.

The complete cathodic protection project embraces a total of approximately 38.2 miles of high-pressure gas line, ranging in size from 2 to 20 in., portions of which were laid bare, some coated. Some of the older, original sections are now 15 years old, while the newer portions were but recently completed, so that the problem was a combination of checking a rapidly increasing number of corrosion leaks on some mains and of preventing any corrosive action on others.

To protect this network of pipe lines under severe corrosion conditions, a total of four ground beds were installed, using sixty-nine 2 by 30-in. "National" graphite ground anodes and coke breeze backfill. In addition a large section of abandoned pipe line was utilized as another ground connection, but its operation is not highly successful. Power to activate the several ground beds is supplied by rectifiers.

THE first gas pipe line distributing natural gas to the city of Rochester, N. Y., a high-pressure 14-in. welded steel line, approximately 18.7 miles long, was laid bare in 1936.

Corrosion leaks began to appear in about 10 years and increased in incidence until 1948. Different methods of extending the pipe-line life and preventing increases in gas loss through corrosion leaks were investigated and it was found that cathodic protection might be the reasonable course to adopt to avoid the expense of locating, digging up, and making repairs. Accordingly a corrosion prevention program was initiated in 1948.

A soil-resistivity survey was made along the entire route of the line, with bell-hole inspections of pipe conditions at locations where the soil resistivity was unusually low. This inspection revealed the presence of a number of "hot spots" where considerable pipe pitting was present. By 1949 leakage had become a problem of serious magnitude and at two locations a total of approximately 4,500 ft. of badly corroded pipe had been replaced with new coated pipe. This precipitated the decision to cathodically protect the entire system.

Before cathodic protection tests

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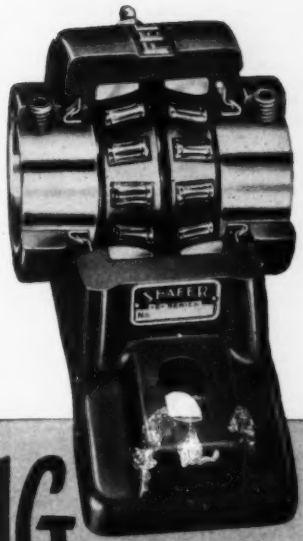

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were made it was necessary to electrically insulate the 14-in. line so that the protection current could be confined. This proved an easy task since the line was found to be entirely free from contacts with foreign lines at crossings. Insulating tubing and washers were used to insulate valve flanges at seven points where the line is tied to other lines.

At one of the water crossings a new bridge had just been completed. Since the earth-fill approaches covered the line to a great depth, repairs at this location would have been costly and every precaution, therefore, was taken to maintain full cathodic protection.

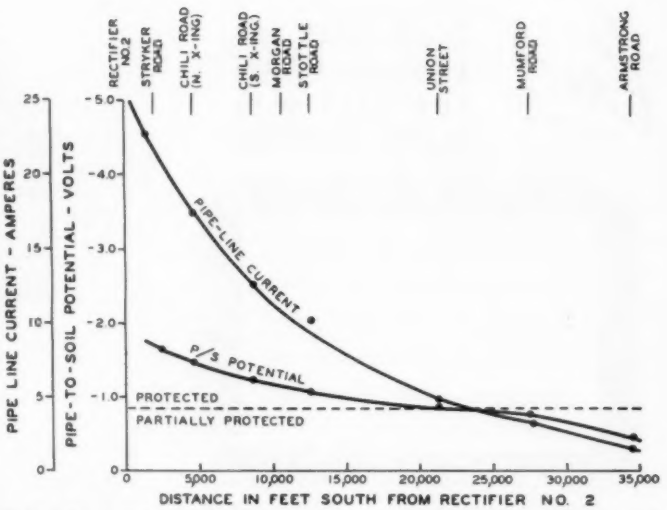
Inspection revealed that where the line crosses on the bridge it contacts the structure at 30 steel supports; also, at each headwall it passes through a steel casing from which it is not insulated. These casings pass directly into valve manholes at each end of the bridge. After leaving the manholes, the line drops to the bottom of the deep fill for the bridge approaches. Since it was impractical to insulate the gas line from the bridge structure but necessary, nevertheless, to avoid cathodic protection current pickup by the reinforced-concrete bridge piers, it was decided to insulate the valves at each end of the bridge and thus completely isolate, electrically, the bridge and that section of the pipe line supported by it. This procedure made necessary an independent cathodic-protection installation on each side of the canal.

At all locations where valve-insulation work was carried out, test wires were installed to facilitate maintenance tests and to permit electrical connection of the lines at any time it became desirable to extend protection current to lateral lines.

The only Dresser coupling bonding work required was on the approximately 4,500 ft. replacement previously mentioned which consists of 3,800 ft. at one point and 700 ft. across a creek.

At the 3,800-ft. replacement, 12 couplings were bonded. None of these were insulating, or "open" at the time although some resistance was noted at one point. Bonding was considered necessary, nevertheless, to avoid future trouble in this critical area.

Insulated copper bonding wire welded to line on either side of coupling. Note center ring is also bonded.



Pipe-to-soil potentials and pipe-line currents measured on 14-in. high-pressure line south of Rectifier 2 with Rectifier 1 operating at approximately 5 amp. and Rectifier 2 operating at approximately 40 amp. Armstrong Road lateral not insulated and coupling bonding at creek crossing not completed.

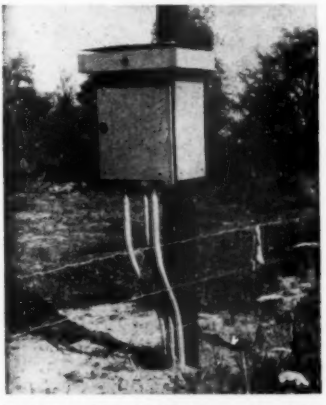
At the 700-ft. creek-crossing replacement, insulating-type Dresser couplings had been installed at either end and 24 standard-type couplings used throughout the replaced length. The two insulating couplings were bonded first. The remaining ones were checked and a number were found to be completely insulating. As a result all couplings, including those under the creek itself, were bonded to permit cathodic protection current to extend beyond this area.

At some of the main-line valve installations, Dresser couplings had been installed on each side of those valves to relieve stresses on the valve body. During the test work none of the couplings gave trouble and were not bonded. Should a coupling later open so that protective potentials on the line are affected appreciably at such locations, the indicating voltmeter readings will indicate the trouble and the coupling can be located and bonded. Voltmeter readings are compared with previous recorded readings and any substantial potential drop is an indication that a coupling has opened and interrupted the protective potential.

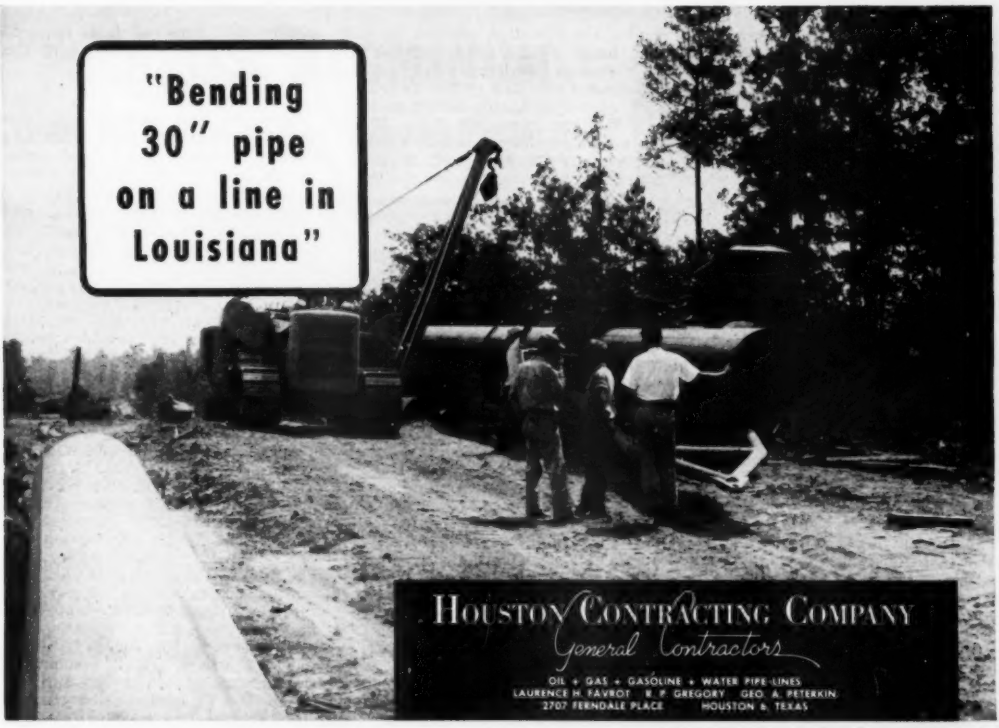
Rectifiers and Ground Beds

The greatest problem encountered in the entire program involved rights-of-way for rectifier locations in the vicinity of those ground areas having suitably low-resistivity soil for ground-bed installations. An unusually large number of soil-resistivity measurements, made by the four-pin method which permits determination of average conditions to any desired depth below the surface, disclosed that in practically all locations suitably low-resistivity soil was quite shallow with high-resistivity sand, gravel, and rock underlying it.

Because of the shallowness of the low-resistivity soil strata, ground rods were installed in a horizontal position and had to be very large to obtain a desirable low-resistance connection. Since the ground beds ranged from 250 to 700 ft. or more in length, it was difficult to find locations of adequate size, in areas where residential building activity was not



Typical rectifier installation on the 14-in. high-pressure gas pipe line system serving Rochester, N. Y.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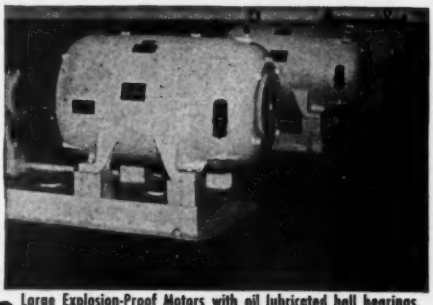

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anticipated, and where the right-of-way could be obtained from land owners at reasonable cost.

Two 12-volt, 40-amp. rectifiers were installed, one at either end of the 3,800-ft. replacement. Twenty-four hundred feet of 14-in. pipe, traversing a swamp, abandoned in place when replacement was made in 1949, is being used as a ground connection for these rectifiers but with only moderate success. The resistance to soil of this pipe bed is higher than expected, so that the rated output of the rectifiers is not being obtained.

These two rectifiers are providing full protection to approximately 5.9 miles, with partial protection to an additional 10.9 miles. The area of full protection includes those sections where the worst corrosion had previously been experienced. Also, it is near the center of the line being protected.

A 250-ft.-long ground bed, installed at the north end of the line, is composed of ten 2 by 80-in. National* graphite anodes, installed horizontally, with coke-breeze backfill. The anodes were spaced 25 ft. apart, in a straight line, parallel to the line and approximately 375 ft. from it. To supply current to this ground bed an 18-volt, 20-amp. rectifier was installed.

In order to extend protective potentials now being obtained there is under consideration another ground bed north of the one protected by two 40-amp. rectifiers which utilize abandoned pipe as a ground bed. This bed, as designed, will be 700 ft. long and contain thirty-five 2 by 80-in. National graphite anodes installed horizontally 20 ft. apart, in coke-breeze backfill.

In the event this additional ground-bed installation is made, a 24-volt, 40-amp. rectifier will be utilized. It has been determined by actual test, using storage batteries as a source of current, that an additional 40 amp. will be sufficient, after polarization, to reinforce the output of the rectifiers already operating and fully protect the line as far as the canal crossing.

Because of the high-resistivity condition of the soil plus the fact that cathodic-protection current requirements increase considerably with pipe-line age, an additional 12-volt, 10-amp. rectifier may be found necessary just south of the canal crossing as added insurance against ever having to dig up the section so deeply buried under the bridge approach. As soon as the area becomes stabilized tests will be made with storage batteries temporarily connected between the line and a good ground to check this requirement. The current output of the batteries will be adjusted until adequate protective potentials are attained; the current from the batteries will be approximately the same as that required from a rectifier if installed at the same point.

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Results

After the first rectifier has been energized, but before the insulating Dresser couplings at the creek crossing had been bonded, data for a pipe-to-soil potential curve were taken.

With the one rectifier operating at 27.5 amp. the line was fully protected up to 21,000 ft. south of the rectifier, with gradually diminishing protection beyond that point. A thin paint on the line was greatly beneficial; if it had been strictly bare, full protection from the rectifier operating at 37.5 amp. probably would have extended no more than 3,000 to 4,000 ft.

After the second rectifier had been energized, but still before bonding of couplings at the creek, a second survey was made along the line south of the rectifiers. With both rectifiers operating at a combined output of 45 amp., full protection extended an additional 4,000 ft. An essentially smooth curve for pipe-line current was obtained, indicating that all pipe south of the rectifier is satisfactorily continuous, electrically, and that there are no serious contacts with other structures. The curves indicated that a relatively small amount of current was required at the south end of the line to reinforce the current output of the two 40-amp. rectifiers

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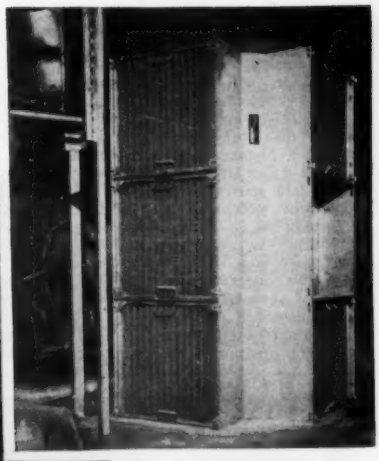

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◀ View of main power plant showing portion of the 80 Nordberg Radial-Type Gas Engines.

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to attain full protection. This current was diverted from the new parallel 20-in. line which is detailed hereafter.

The survey data show, too, that changes in soil potentials due to ground-bed current are occurring as far as 2,000 ft. away. This means that from a point opposite the ground bed and for a distance of approximately 1½ to 2 miles in each direction, the ground-bed current produces high pipe-to-soil potentials that will tend to loosen the coating bond on the pipe. There seems to be no way to avoid this and still have adequate protective potentials on a substantial length of pipe line. Any loosening of the bond which may occur will not be particularly detrimental as long as cathodic protection is maintained, but if the coating alone were again to be depended upon its protective qualities might be impaired.

After the Dresser coupling at the creek crossing had been bonded, and with both rectifiers in operation, a pipe-to-soil potential and pipe-line current survey indicated that with 20-amp. flowing to the north portion of the line, about 9,000 ft. of line is fully protected. This performance is not as good, proportionately, as was observed south of the rectifiers, but was expected since the northern part of the line contains many more corrosive areas than does the southern part, resulting in more rapid deterioration of the pipe paint and thereby increasing the current requirements for cathodic protection.

Current requirements for the completed cathodic protection system on this line do not exceed a total of 105 amp., distributed as follows: 45 amp. from the two rectifiers connected to the abandoned pipe-line ground bed, 40 amp. from a proposed unit between there and the canal crossing, 10 amp. between the canal crossing and the north end of the line, and 10 amp. diverted to the south end of the line from the protection system on the 20-in. line paralleling the 14-in. line. This maximum of 105 amp. represents a unit current requirement of 0.29 ma. per square foot of pipe surface for the 18.7 miles of 14-in. pipe. This is low in view of the type of paint used on the line; the unit current requirement for bare pipe lines often can be 10 or more times that obtained on the 14-in. line.

Road Crossings

At one of the road crossings the line is cased with steel pipe, open at the ends and not vented. The line is not insulated from the casing. Since this road is a graveled secondary thoroughfare, it may be assumed that the other road crossings along the line are similarly cased. Although the line as a whole is receiving full cathodic protection, corrosion still can occur inside the contacting casings. Since such corrosion proceeds at a very slow rate, it does not appear advisable to uncover and rework the road crossings. However, should a road crossing require replacement because of corrosion leakage or some other cause, the casing should be provided with insulating bushings at each end when reinstalled to keep it out of electrical contact with the carrier pipe. The carrier pipe should be equipped with insulating spacers or bands of builtup coating material to prevent electrical contact with the casing pipe.

When the entire cathodic-protection installation was completed, pipe-to-soil potential measurements were taken at road crossings to obtain data for protective potential curves. Line-current measurements are a helpful addition to the survey. The data were plotted and made a part of the permanent operation records. At the end of the first 6 months and the first year of operation, similar potential curves will be plotted and compared with the initial data to determine whether or not the protective system is continuing to operate as expected. After the first year, if the system is operating satisfactorily, yearly surveys should be sufficient.

To facilitate pipe-to-soil tests for potential surveys or tests made in cases of trouble, permanent test wires were attached to the line at all road crossings. For permanence the test wire is protected by conduit above the surface and terminates in a junction box attached to a pipe-line marker.

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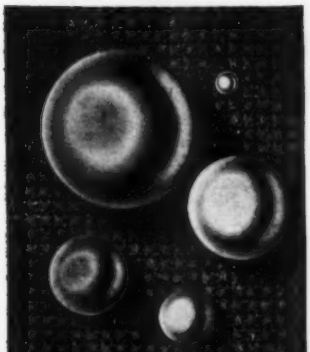

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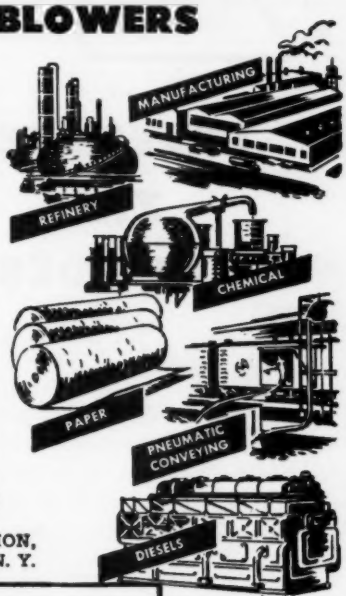

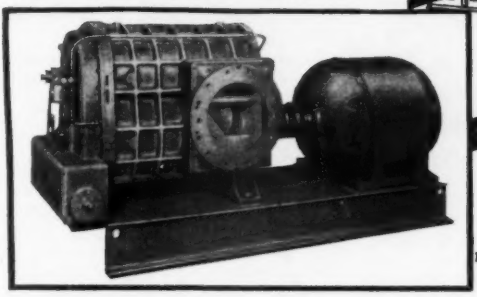

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Fig. 700A Heavy Duty Seating Device

Fig. 800 Heavy Duty Sand Pump

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were installed at selected locations along the line where they can be read periodically in the course of normal operations. They are connected between protected pipe and a suitable stable reference. The reading is recorded when the protected line is known to be fully protected; thereafter, weekly readings are entered on a continuing record and compared with previous readings. A marked drop in a reading usually is an indication that the protective potentials have been reduced or lost altogether and the corrosion engineer should make tests to determine the trouble and correct the condition. Thus serious trouble is known within a week, whereas it might not otherwise be detected, particularly in the case of a contact, until the yearly complete survey is made. On this line some variation in the readings at one or more of the voltmeters is expected.

12-In. High-Pressure Gas Line

Another high-pressure line running to Rochester consists of about 11.5 miles of pipe, including approximately 9¼ miles of coated 12-in., 1.6 miles of coated 14-in., and ¼ mile of coated 16-in., plus a short section of bare 12-in. Of the coated pipe (coal-tar enamel and asbestos-felt wrap) approximately 1.8 miles was installed in 1945, and contains 302 Dresser couplings at 20-ft. nominal spacing. The remaining 9¼ miles was constructed in 1949, of welded steel pipe with 275 Dresser couplings placed where necessary to expedite construction.

Since it is so new there were no known corrosion leaks but because of the numerous potentially corrosive areas traversed by the line, a cathodic-protection system was put in as a preventive measure.

Conditions were such that protection could be applied at reasonable expense to approximately 9¼ miles of the line covering all of the most potentially dangerous corrosive area. Although the remainder of the line is in a relatively corrosion-free area, the locality is congested, repair of corrosion leaks would be expensive, and danger from escaping gas is greater. For these reasons, it may be highly desirable later to extend protection to the remainder of the line by bonding the couplings.

Cathodic - protection - current requirement tests showed that a total of 9 amp. at two locations would be sufficient to protect the 1949 section of coated pipe. The tests also revealed rapid loss of protective potentials in some areas due to resistance of Dresser couplings and indicated that had the line been of solid welded construction or if all couplings were solidly bonded, the entire line could be protected with one small rectifier at an estimated output of 4 to 5 amp. It was believed impractical to attempt to protect the entire line from one location because the Dresser coupling resistance would necessitate very high pipe-to-soil potentials near the rectifier to obtain minimum protective potentials at the extremities.

Insulating and Bonding

Field tests showed that on the 1949 section of approximately 9¼ miles the coating resistivity was satisfactorily high and that the line was free of contact with foreign structure with the exception of the area in the vicinity of the canal bridge. The bonding was confined to a 1-mile-long section near the midpoint of the line. Nearer the eastern end of the line, cathodic-protection potentials were limited by the Dresser couplings installed every 20 ft. to about one-third of the section.

All of the Dresser couplings in the center areas of the line were bonded so that potentials from the two planned rectifiers would reach all the main. This work was done after the first rectifier was placed in operation by working from each end of the area toward the middle and testing each coupling shown on the detail maps. The pipe-to-soil potential on each side of these couplings was measured by contacting the main with a probe rod; each coupling that required bonding showed a marked difference in the readings and was bonded with

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single 1/0 insulated copper wire cadwelded to the line on either side. Couplings installed in 1949 did not require a bonding wire to the center ring because they are protected by a poured mass of pipe-line enamel.

The 12-in. line is crossed at one place by an oil line which is cathodically protected by a 48-volt, 40-amp. rectifier. Soil-potential swings from this large rectifier installation are so great that the 12-in. gas line picks up current at the crossover area and discharges it at more remote points with resulting corrosion to the 12-in. line. This condition should be eliminated by the new protection installation but the operators of the protected oil line have been asked to furnish a location map of their line so that any point of crossing of the two structures remote from the oil company ground bed may be located. A bell-hole inspection of the 12-in. line will be made at each crossing to see if any serious damage to the line has already occurred.

To be certain that full protection on the 12-in. line is attained at remote crossings, the potential of the line will be checked with respect to copper sulfate electrode placed directly above the line at 5-ft. intervals for about 50 ft. on either side of the crossing. A careful line-current measurement may also be made on the gas line on each side of the crossing to determine if there is any current loss to the protected oil line. When making current measurements the nearest line contacting rod on either side of the crossing should be about 100 ft. from the crossing. Dresser couplings should not be included in the current-measurement span.

Rectifiers and Ground Beds

The soil where the initial ground bed was installed was not particularly favorable but as suitable as could be found in the area. Low-resistivity soils were found on the western part of the line. Current requirement tests indicated that two 12-volt, 10-amp. rectifier units would furnish adequate current for protection of the entire line; also that had all of the Dresser couplings been bonded when installed, the entire line could have been protected with only one 10-amp. rectifier installation.

A ground bed was placed about 115 ft. from the line, consisting of ten 2 by 80-in. graphite anodes, spaced 25 ft. apart, and installed in a ditch 250 ft. long, perpendicular to the line. The anodes were installed horizontally, centered in coke-breeze backfill averaging 20 in. wide and 9 in. thick, extending the full length of the ground bed. Ten tons of damp coke breeze was used.

There were no construction difficulties at this location as the site was readily accessible and relatively dry. The ground-bed trench was cut with a ditching machine and the coke breeze delivered at the ditch as required. The anode ditch was cut 20 in. wide rather than the 12 in. specified because it was felt that the wider trench should make the over-all ground-bed resistance slightly lower (as is desirable) although somewhat more coke breeze was required.

Soil tests made with Shepard canes along the bottom of the ground bed trench revealed that most of the anodes were installed in soil of between 2,000 and 3,000 ohm-cm. resistivity. The 25-ft. anode spacing placed more dependence on the coke breeze to form a suitably conducting supplementary anode between the graphite rods.

After the ground bed was completed, its resistance was some higher than anticipated. A detailed ground-bed continuity test was then made to check for any adverse effects due to the 25-ft. spacing between anodes. The test indicated that the coke-breeze layer is reasonably continuous for the length of the ground bed and the high ground-bed resistance probably is due to insufficient tamping of the backfill.

A 12-volt, 10-amp. rectifier was installed between the ground bed and the pipe line. The power output was adjusted to deliver an average pipe-to-soil potential of —0.85 volt to remote copper sulfate electrode. The extent of the variation in the observed pipe-to-soil potential, due to stray current effects, will be checked over a 24-hour week day period by connecting a Bristol smoked chart recording voltmeter between the protected line and a driven ground rod at the regulator station. If variations are severe the pipe-to-soil potential will be increased above the usual —0.85-volt level to insure complete protection 90 per cent of the time or better.

The placing of a second rectifier and ground bed is pending decision based on more complete data on initial results. If reasonably low-resistivity soil is found at sufficient depth (10 ft. or more), ground rods will be installed vertically. Otherwise a horizontal-type bed will be necessary with the trench dug deep enough to be in the low-resistivity soil.

If vertical anodes are installed in 3,000 ohm-cm. soil, 10 anodes spaced 15 ft. apart should result in a 2-ohm ground bed, which is sufficient to allow 5-amp. maximum drain from a 12-volt, 10-amp. rectifier. The 10 anodes are suggested in anticipation of high-resistivity soil underlying that in which the anodes are installed. To meet this condition a correction factor of approximately two has been applied over and above that which would be applied if reasonably low-resistivity material were present in the lower subsoils. If a horizontal-type ground bed is built the graphite rods should be placed 25 ft. apart in coke-breeze backfill.

Meters and Records

The d.c. voltmeter and ammeter, and kilowatt-hour meter at each rectifier installation are read monthly and the values entered in the cathodic protection records. On this particular line detailed tests of protection will be made every 6 months because the Dresser couplings in the line may open up at any time and reduce the effective protection. Under certain conditions, the effect of an open coupling might not be noticeable on the readings of indicating voltmeters only, similar to those installed on the 14-in. high-pressure line.

Soil-potential tests, made during the periodic tests, should be at every mile along the line, at all critical points such as the extremities, at each side of the river crossing, and at crossings with the protected oil line previously discussed. Permanent test points were established similar to those on the 14-in. line. Running records are kept on this line as on the others.

4-In. Line

The 4-in. line is considered to be approximately 7,700 ft. long, although it includes 400 ft. of 3-in. and 250 ft. of 2-in. As was the practice until a few years ago, all of this line was laid bare except 800 ft. of 4-in., 100 ft. of 3-in., and 200 ft. of 2-in. pipe.

Corrosion was of minor magnitude except on a 2,330-ft. section of 4-in. pipe which passed through a low wet area adjacent to a lake where much of the land traversed has been filled in and is extremely corrosive.

This section has been replaced with coated steel pipe; all replacements were directly due to corrosion leakage. In 1945, 308 ft. within this section was replaced again and coated with tar paint. By 1950 it was leaking so badly that it was again scheduled for replacement—a service life of only 5 years!

During 1950, application of cathodic protection to those sections of the 4-in. line mentioned above was considered as a means of eliminating additional replacements. Field engineering was carried out at the same time the protective system for the 14-in. high-pressure line was being designed. It was found practicable to cathodically protect the entire line rather than only the coated replacements as originally contemplated. In addition, it was decided to cancel the scheduled replacement of the 308-ft. section which had been replaced in 1945. The leaks were to be repaired and the protective system depended upon to eliminate further corrosion.

Insulating and Bonding

The first actual work on the line was the insulation of service connections at the meters. This was done by using insulating bushings in reducing fittings installed in the meter loop between the regulator and meter.

Tests were made at 20 meter installations to check the presence of dangerous a.c. conditions. Only 6 of the 20 were found to have any a.c.

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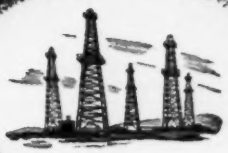

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potential across the insulated fitting and this ranged only 0.1 to 0.43 volt which is not considered dangerous. It was likewise found that in each instance where an a.c. potential was observed, an automatic water heater was present which insures a solid interconnection between the customer's water piping and gas piping; this practically eliminates the possibility of the a.c. potential across the insulating fitting ever attaining dangerous proportions.

Since there is no flanged valve at the point where this line connects to the rest of the system, it was necessary to install an insulated fitting near this point by using an insulating Dresser coupling.

A test wire was installed at each side of the insulated fitting terminating in a test box mounted on a power pole. These test leads facilitate checking the condition of the insulation and will permit line potential measurements at this extremity of the line.

To maintain protective potentials any additional services that are laid must be insulated at the meter to prevent contacts with the water system, and also must avoid contact with other underground structures. If coated pipe is used much less additional drain will be imposed on the rectifier installation than if bare pipe is used.

Rectifier and Ground Bed

An adequate location for ground beds was selected reasonably close to the center of the critical area on the line. The field tests indicated the need for a 12-volt, 10-amp. rectifier located about 112 ft. from the ground bed location. Since this line was not completely insulated from the rest of the system during the period of the field tests, the total estimated current requirements for its protection were based on the total amount of bare and coated line to be protected. Using a unit current consumption of 2 ma. per square foot for bare pipe and 0.015 ma. per square foot for coated pipe, the requirements for the total linear footage of the various sizes of pipe involved are 17,431 ma., or approximately 17.5 amp.

Although current requirement for bare pipe was taken at 3 ma. per square foot it is sometimes appreciably less, depending on the amount of scale on the pipe. The interspersion of coated sections of pipe along the bare line assists in getting more nearly uniform current distribution.

After the rectifier was placed in operation, pipe-to-soil potential tests were made, using a probe rod put down about 10 ft. on either side of each coupling. Couplings that had considerable resistance, as shown by a lower potential reading on the side away from the rectifier, were bonded.

A pipe locator was used to check possible contacts with foreign structures. The transmitter was connected between the pipe line and the structure suspected of being in contact with it. The pipe-locator receiver produces a strong tone on the line as far as the point of contact, with a weak signal beyond.

After coupling bonding and contact clearing work was completed the rectifier was allowed to operate at full output for several days to permit the bare pipe sections to become polarized. Pipe-to-soil potentials were then checked along the line to determine the extent of protection and the rectifier adjusted to produce full protection to the line.

The ground bed was constructed of ten 2 by 80-in. graphite anodes placed horizontally in coke-breeze backfill in 3-ft.-deep trench. The anodes are spaced on 10-ft. centers, on a straight line parallel to the pipe line, at a distance of approximately 165 ft. The bed was built with two header cables running the length of the ground bed and with two positive feeder cables running from the ground bed to the rectifier. The wire on each anode is connected to both header wires. The duplicate wiring was provided to insure freedom, insofar as practicable, from interruption due to wire breakage. This was felt necessary because the ground bed area is scheduled for filling which will place

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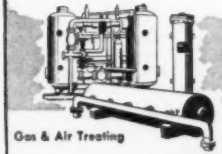
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the ground anodes about 7½ ft. below the surface, making it difficult to dig down to the anodes for maintenance work.

The horizontal construction was necessary here also because the lower-resistivity soil was close to the surface. Because water was continually flowing into the ground-bed trench from a nearby pond, construction of the bed was difficult and it was impossible to firmly compact the coke-breeze backfill around the anodes to produce a lower-resistance ground bed. The soil backfill held the coke breeze in position but did not have sufficient weight to force the water out of the breeze and, therefore, the initial resistance of the ground bed was higher than that for which it was designed. As long as the resistance remains high the full output of the rectifier cannot be realized. When the area is filled the weight of the additional 5 ft. of fill should be sufficient to compact the entire ground bed and improve its performance. Even if additional compacting were not necessary, the presence of the fill, particularly in low-resistivity material, will improve the ground-bed output because of the greater mass of earth surrounding the bed into which the current will flow.

One definite advantage of the extremely wet location is that the bed never should become dry enough during droughts to cause any increase in ground-bed resistance.

After the ground bed was completed its resistance was checked and found to be 1.35 ohms in contrast to an expected 0.8 ohm which should be attained after the proposed filling operation is completed.

Potential drop measurements taken along the pipe on either side of the rectifier location determined that current from the bed was dividing quite equally, which would also indicate that there are no contacts with the water system in the immediate vicinity.

The same type of meter and instrument installations were made on this line as for the others and the schedule of readings and records is likewise being followed.

20-In. High Pressure, Paralleling 14-In.

The new 20-in. line constructed parallel and adjacent to the 14-in. line in 1950 is approximately 6½ miles in length. The pipe is of ⅜-in. wall thickness, weighs 78.6 lb. per foot with welded joints except for a few Dresser couplings at road and railroad crossings. A coating of coal-tar enamel with glass-felt reinforcement was mill applied and the field joints were coated.

Cathodic protection is desirable on this new line as a protective measure since corrosive soils are present in the area traversed.

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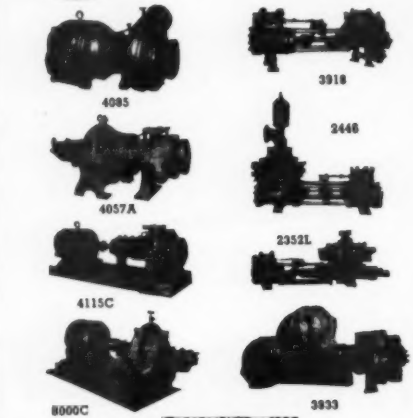

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Soil tests and pipe-to-soil-potential measurements were made according to the schedule followed during the earlier parts of the over-all program.

All Dresser couplings were bonded and the line insulated from existing mains by insulating flanges at points of tie-in.

On the basis of 0.015 ma. per square foot of pipe surface to protect an enamel-coated pipe, it was estimated that the 6½ miles of 20-in. line would require about 3 amp. of current for full protection. Actually the requirement was considerably less than the estimate. Later tests showed that 10 amp. was sufficient to protect this line as well as the southern end of the 14-in. line, as mentioned in the discussion of that construction.

A ground-bed site was selected about 175 ft. from the line and a bed installed, essentially at right angle to the line, consisting of fourteen 2 by 80-in. graphite anodes, placed on 15-ft. centers, in coke-breeze backfill. The three anodes most remote from the rectifier were placed vertically but the nature of the soil made this impracticable and the remaining 11 were put in horizontally. The soil at this location is a white marle saturated with water, with a tendency to be quicksandy below about 3 ft.

An 18-volt, 20-amp. rectifier was located about 195 ft. from the near end of the ground bed. The capacity of this rectifier is adequate to fully protect the 20-in. line, with sufficient surplus to divert to the 14-in. line to reinforce the rectifiers already installed on that line.

The rectifier was adjusted to furnish a minimum of —0.85 volt with respect to copper sulfate electrode at any point along the line, but at the same time limiting the maximum potential at any point to —2.0 volts.

The insulated flanges at each end of the three points of interconnection between the new 20-in. pipe and the existing 14-in. were checked and suitably insulated in order to determine at which points current could be diverted to the older line.

Economics

The cathodic-protection program was undertaken in the belief that halting further deterioration on certain old steel pipe lines, which had become important as load and pressures increased, was more feasible than replacement in some cases. This belief was based on the experiences of other utilties and pipe-line operators. Since the program still is in the formative stage no accurate analysis of cost comparison can be made. However, it may be stated that in the case of the 14-in. line the cost of applying cathodic protection on a per foot basis was less than 3 per cent of the cost of making a particular expensive replacement before protection was applied.

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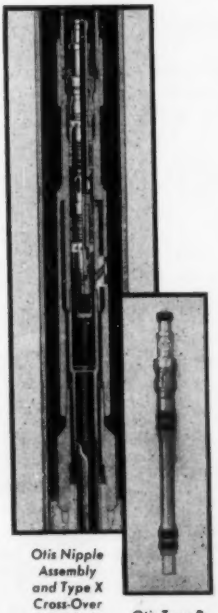

Otis Nipple Assembly and Type X Cross-Over Flow Choke

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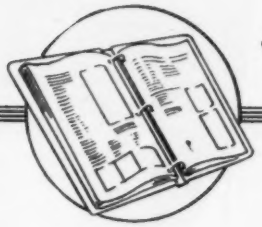

THE REFINER'S notebook

No. 107

How to Prevent Explosions*

ORDINARILY it is difficult to eliminate completely all sources of ignition such as open flames, static sparks, inductive sparks, electric arcs, hot wires, compression, shock, friction, heated surfaces, and hot flying particles. Static sparks often can be reduced to impotency either by grounding the materials which accumulate charges producing these sparks, or by keeping all such materials at the same potential. Sealed lights, etc., may be used in explosive atmospheres but become a hazard if broken or defective. Regular inspection is important.

Ventilation, warning agents.—Leakage of natural gas under cellarless buildings can form explosive mixtures if space under building is not well ventilated. Warning agents such as ethyl mercaptan may be added to odorless combustible gases to warn of leakage.[1]

Use of inert gases.—Nitrogen, helium, carbon dioxide, steam, exhaust gas, etc., may be added to the combustible.

In Fig. 1 points along the line **abcd** represent mixtures of air and gasoline vapor only (i.e., without added nitrogen). Point **a** corresponds to oxygen content of pure air (20.93 per cent). Point **b** is lower and point **c** upper limit of flammability of the gasoline vapor in air. Mixture represented by point **d** on line **abcd** is 8.5 per cent vapor and 19.1 per cent oxygen and is above the upper limit. If air is added, composition changes along line **abcd** in the direction of point **a**. When point **c** is reached mixture becomes flammable and remains flammable until point **b** is reached. Further addition of air will cause composition of the mixture to approach the limiting value at **a**.

Composition at point **e** in nonflammable Region 3 is 6.5 per cent vapor and 13.0 per cent oxygen. If this mixture is diluted with air, the composition again changes along a straight line. This time the line goes from point **e** to point **a**. As the mixture becomes more dilute the composition crosses the boundary between Region 3 and Region 1 and becomes flammable; it remains flammable until it crosses the boundary between Region 1 and Region 2, after which it will become nonflammable again. Subsequent dilution simply causes the composition of the mixture to approach the limiting value at **a**.

If it is desired to dissipate the mixture at **e** in air and at the same time avoid the flammable area nitrogen must be added to the mixture until line **af** is reached. (Addition of oxygen-free nitrogen would cause the composition of the mixture to approach the origin, i.e., 0 per cent vapor and 0 per cent oxygen.) As it approaches the origin the composition line crosses **af** at **h**. If air is now added to the mixture (at composition **h**) the composition follows a straight line to **a** without passing through the flammable area.

Region 2 is bounded on one side by line **af**. At point **f**, 4 per cent vapor corresponds to 100 per cent added nitrogen (i.e., 0 per cent oxygen or 0 per cent air). This means that if the ratio of added nitrogen to vapor is 100 to 4 (i.e., 25 to 1) or greater, the mixture can be diluted with air without passing through the flammable area.

The gasoline vapor can also be rendered nonexplosive in air by adding enough liquid carbon tetrachloride to the liquid gasoline for the carbon tetrachloride vapor to make gasoline vapor nonflammable in air.[2] Inert gases and vapors do not all have the same flame-quenching power. Carbon tetrachloride, for example, has several times the quenching power of nitrogen.

Explosions in vapor-air mixtures may be prevented by keeping the temperature of the liquid outside the flammable range. (See example for styrene in installment No. 106.)

Minimizing explosion damage. — Ordinary flames may undergo transition to detonation, which is a flame traveling at speeds well above the velocity of sound. Flame arresters have been developed for stopping the travel at ordinary flame speeds but not to stop detonations. Flame arresters should be inspected regularly for corrosion and dirt. Forced ventilation may be used to dissipate explosive mixtures near their source. Another means is segregation of hazardous operations and materials. Portable indicators of hazardous atmospheres are available as well as larger stationary gas indicators, alarms, and recorders that may be located at points remote from the atmosphere being tested.

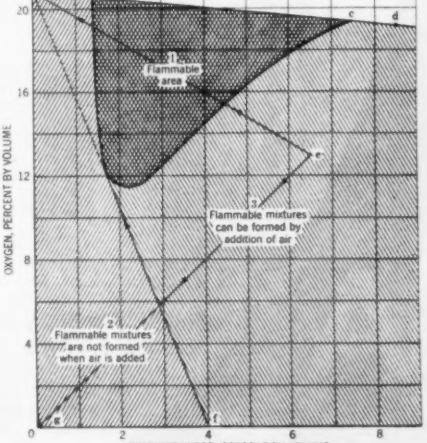

Fig. 1 — Flammability relations between gasoline vapor and oxygen content in mixtures of gasoline vapor, air, and added nitrogen.[3]

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1. "Warning Agents for Fuel Gases," Bureau of Mines Monograph 4, 1931.

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3. Jones, G. W., and Kennedy, R. C., "Explosion and Fire Hazards of Hydrocarbon - Carbon Tetrachloride Mixtures," Bureau of Mines I.C. 6805, 1934.

4. Armistead, George, Jr., "Safety in Petroleum Refining and Related Industries," John G. Simmonds & Co., New York, 1950.

*From Bureau of Mines I.C. 7601, "Gas Explosions and Their Prevention," by G. S. Scott, R. E. Kennedy, and M. G. Zabetakis.

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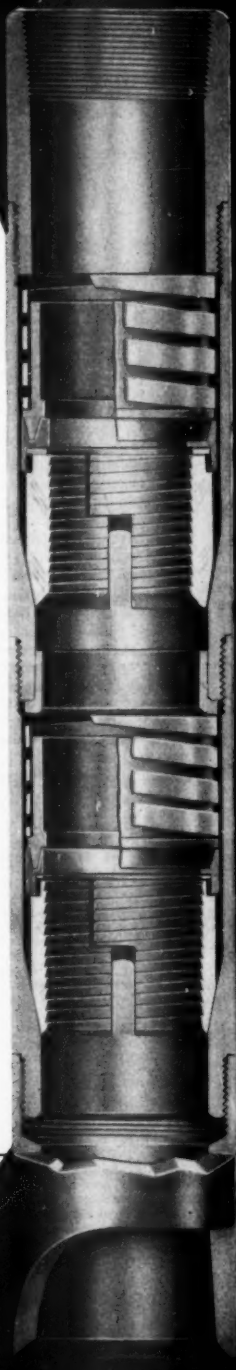

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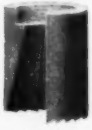

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ENGINEERING FUNDAMENTALS

No. 473

Change of Flood Coverage With Mobility Ratio

THE prediction of the degree to which injected fluid covers a flooding pattern is usually based on the assumption that paths of fluid flow are given by Darcy's law, as it applies when the flooding element is completely filled with a uniform fluid. This condition is not generally encountered in practice and it is of interest to examine another basis for computing flood coverage. The approach considers that the distributions of flow potential ahead of the flood front differ from those behind the flood front.

The chief causes for differences in potential behind and ahead of the flood front are the differences in the effective permeabilities and viscosities. Pressure drop according to Darcy's law is proportional to μ/k. Hence if the fluid behind the flood front has a much higher μ/k value than the fluid ahead of the flood front, the majority of the pressure drop across the system occurs between the injection well and the flood front. The extreme, for example, would be the injection of a viscous liquid into a dry sand bed. Under these circumstances, the injection of liquid proceeds with little regard for the placement of production wells, because virtually all pressure drop is in the injected liquid zone.

Consider Fig. 1 by way of explanation. An injection well is at the corner of a five-spot quadrant, as marked. Assume that the position of the injected fluid front is a circle as marked. If the potential distribution causing flow as is given by Darcy's law for a five spot (dotted lines), the potential causing flow at point A would be greater than that at point B, because along the latter flow path the equal potential lines are farther apart. Thus at the instant considered, the front at A would be moving faster than at B and distortion from the circular advance would occur.

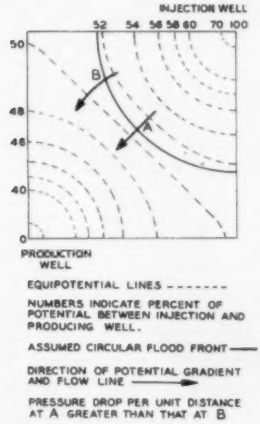

Fig. 1—Five-spot quadrant. (Adapted from Muskat's Flow of Homogeneous Fluids Through Porous Media.)

Now, let the μ/k value behind the flood front be extremely large compared to that ahead of the front. The potential distribution will not be that of Darcy's law as in Fig. 1. Then, for all practical purposes the drop in pressure between all points of the flood front and producing well is zero. This means that the pressure gradient is the same at point A as at point B because the injected liquid advance is circular and consequently the front will move with the same speeds at A and B, thus maintaining a circular pattern.

Under these conditions of flood advance, the injected fluid from all injection wells would proceed as circular patterns until fluid from separate wells interfered. As a minimum, therefore, the flood coverage should be the area covered at the time of interference. This has been given in the literature.[1] Reproduced here as Fig. 2 are the interference patterns for the five spot, seven spot, and four spot. The areal coverages are 78.6, 60.5, and 90.8 per cent respectively. It is of interest to note that the coverages at the point of interference of the five spot and four spot are both greater than the coverages at point of first water breakthrough computed on the basis of steady-state flow paths (i.e. 72.3 and 74.0 per cent). In fact with a mobility ratio of zero (i.e. $k_w\mu_o/\mu_w k_o = 0$) the coverages on all patterns should be 100 per cent. It is to be further noted that on this basis, the coverage for the four spot will differ from that for the seven spot, whereas computation on basis of steady-state flow paths gives these coverages as equal.

Similarly, if the fluid behind the flood front is infinitely mobile (low μ_w/k_w) compared to the fluid ahead of the flood front (high μ_o/k_o), the pressure at all points up to the flood front would be the same as that at the injection well. (In fact, this can be looked upon as being equivalent to drilling a much larger well). The assumed circular flood front of Fig. 1 would then tend to distort immediately, because the pressure drop at point A would be greater than that at point B. As an extreme, the driving fluid would finger immediately to the producing well. Thus, the limiting coverage could be zero at infinite mobility ratio. In effect, this tendency occurs in gas drive, whereas it does not occur in water drive unless the oil viscosity is extremely high.

References

1. Yuster and Calhoun, Behavior of Water Injection Wells, Producers Monthly, November 1944.
2. Aronofsky, Mobility Ratio, A.I.M.E., Oklahoma City, October 4-6, 1951.

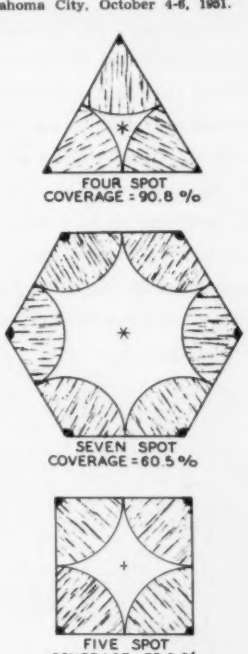

Fig. 2—Flood coverage of interference of radial encroachment patterns. Mobility ratio zero.

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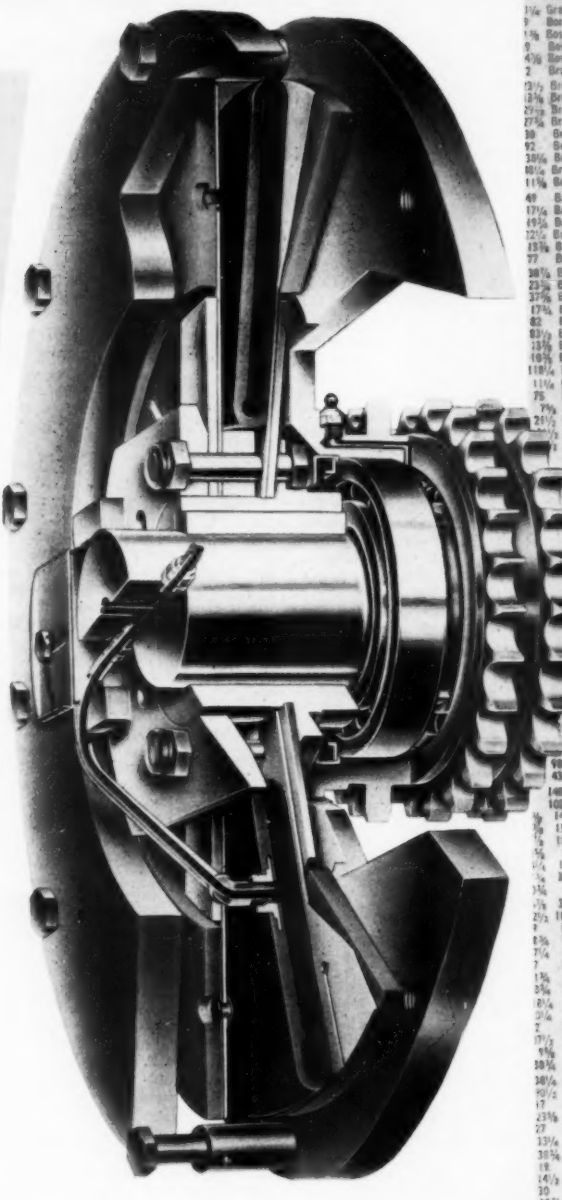

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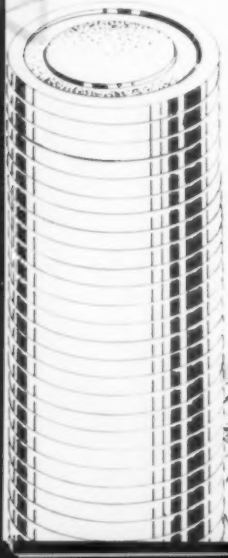

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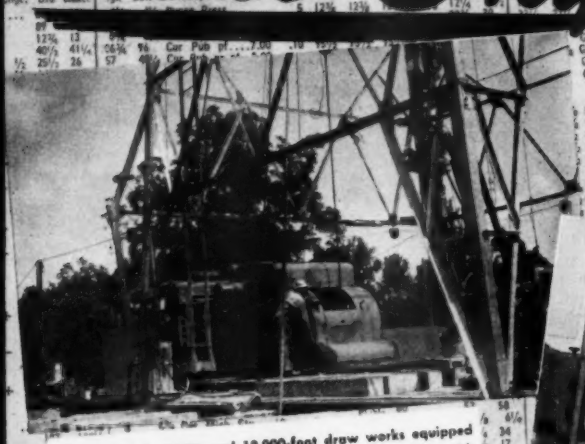

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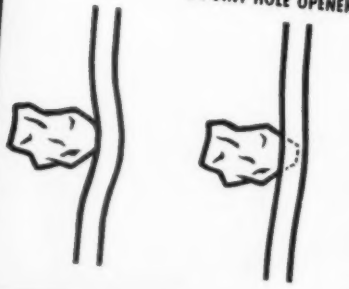
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Among the Drilling Contractors

Four Contracts Awarded In East El Dorado Field

Four new contract jobs are getting under way in the East El Dorado field, Union County, Arkansas. Whitehurst Drilling Co., Shreveport, has two of the new contracts, one being with Marine Oil Co. for a 3,600-ft. well, and the other with Pan-Am Southern Corp. for a 3,700-ft. test. Montgomery Drilling Co., El Dorado, also has a contract with the latter operator for a 3,700-ft. test. Roberts Petroleum Co., El Dorado, has the contract on a 3,200-ft. well which C. J. Salsbury & Sons are starting.

Herbell Enters List of California Contractors

Herbell Drilling Co. is a new entrant in the contract drilling field in California, with offices at 645 East Wardlow Road, Long Beach. The firm is composed of H. H. Herder, who will be in charge of field operations, and J. A. Campbell, Long Beach manufacturer of natural gas and gasoline equipment. The company's first contract was to drill Continental Oil Co. 1 Dera Kenny in Castaic Hills field, Los Angeles County.

Mohawk Drilling Co., Oklahoma City, has taken an Anderson-Prichard Oil Corp. farmout located 3 miles north of Harrah, Oklahoma County, Oklahoma, on which it will drill a Wilcox sand test for its own account. Spot location of the test, 1 Dunlap, is in the NW NW NE 1-12n-1e. Objective is expected around 6,000 ft.

N & R Drilling Co., Holdenville, Okla., has a contract with Clark C. and Marshall Nye of Oklahoma City for a 5,100-ft. test to be drilled 2½ miles southwest of Sparks, Lincoln County, Oklahoma. Location is for 1 Richards, NW NW NW 23-13n-4e.

Southeastern Drilling Co., Dallas, has contracted with Continental Oil Co. for a 14,000-ft. test to be drilled at a wildcat location a mile south of the new Virilla field, in Madison County, Mississippi. The test is located on Continental's Lee lease, in 4-9n-2e.

Quad Drilling Corp., Shreveport, has two new contracted wildcat jobs under way. One is a 5,000-ft. test being drilled for Sneed Brothers at 1 Williams, C NW SW 7-18n-2w, 3 miles east of Moorhead, Leflore County, Mississippi. The other is a 3,000-ft. test for Frank Scheller at 1 Davis et al, in the W½ SW SW 5-11n-11w, in the Bull Bayou area, 5 miles southwest of Evelyn, DeSoto Parish, Louisiana.

San Joaquin Opens Field

San Joaquin Drilling Co., Los Angeles, was the contractor on the discovery well of the new field just opened by The Texas Co. 6 miles west of the Greeley field in Kern County. The discovery well, completed in the Stevens sand at 10,000 ft., was 1 K. C. L. Goosloo, in 20-29s-25e. This contractor has five other rigs at work in California, one being on another Texaco wildcat located just south of the Salton Sea in Imperial Valley.

Falcon Seaboard Drilling Co., Tulsa, is drilling for Shell Oil Co. at 1 Larson, SW NW SW 2-13n-53w, a southwest extension test for the Potter area in Cheyenne County, Nebraska.

Mora Drilling Co., Tulsa, has taken a contract for a 7,500-ft. test to be drilled in the East Oconee area, Coal County, Oklahoma, for J. H. Criswell of Ada, Okla., and Ralph Stone of Las Vegas, Nev. Location is 1 Stanolind, in the C SE NE 33-1n-9e.

J. M. Creel, cable-tool contractor, is drilling for W. B. Grant of Oklahoma City at 1 Hanefield, NW NW NW SE 4-2n-10w, east of Fort Sill and 10 miles northeast of Lawton, Comanche County, Oklahoma. Contract is for 1,300 ft.

Goe Drilling Co. is drilling a 2,500-ft. wildcat test for Wood Oil Co. at 1 Mesner, NE NW SE 22-22n-4w, Garfield County, Oklahoma. Location is about ¾ mile west of abandoned production in the Garber field.

Slusser Drilling Co., Marion, Kans., has a new contract job under way 9 miles northeast of Newton in northeastern Harvey County, Kansas, just south of the Marion county line. The test, 1 White, NE NE NW 3-22-2e, is being drilled for J. P. Gaty.

Allied Supply Co., Shreveport, contractor on Alcan Oil Co.'s recently completed discovery well of the Artesian field, in Calhoun County, is starting another well in the area for the same operator. The new location, 2 Smith, in the S½ SW SW NE 17-15s-13w, is 600 ft. north of the discovery producer, completed in Meakin sand at a total depth of 2,580 ft. This con-

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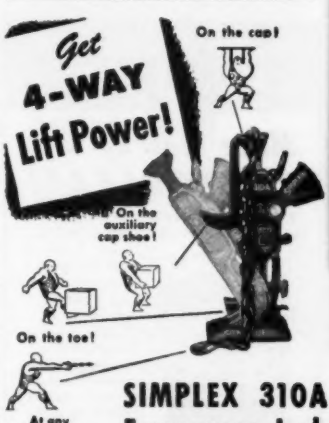

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tractor has another new job under way for the same operator in the Hampton field, also in Calhoun County. It is 10 Southern Kraft, a Meakin sand test.

Basin Drilling Co., Owensboro, Ky., has a rig working for Ashland Oil & Refining Co. in the new productive area opened by Walter Duncan and associates 6 miles southeast of Sebree, in northeastern Webster County. The Ashland test, 1 Preston, is a north offset to the discovery well, completed in Rosiclare lime around 2,700 ft.

N. V. Duncan Drilling Co., Fairfield, Ill., is the contractor on a test which Theodore R. Lindsay is starting at a wildcat location southwest of Elliottstown, southeastern Effingham County, Illinois. Location is on the operator's Horath lease, in the SW SW NW 2-6n-6e.

Penrod Drilling Co., Shreveport, is moving a rig to a wildcat location about 4 miles west of the Sharon Ridge field in southwestern Scurry County, where it has a contract with McAlester Fuel Co. of Magnolia, Ark., to drill an 8,600-ft. Ellenburger test. The test, 1 T. P. Allen, is on a spread recently assembled by A. J. Welborn, Lubbock, Tex.

Lodestar Drilling Co., Edmonton, will be the contractor on a wildcat test which Sun Oil Co. has projected for the Faust area in northwestern Alberta Province, in Canada. The test, located in LSD 11, 8-71-12w5, will be carried to the Cambrian, expected around 7,300 ft. Location is 13 miles southwest of Faust.

Trans-Tex Drilling Co., Longview, Tex., has a new job under way in the Earl Lee field, Wood County, East Texas, where it is drilling for Hollandsworth Oil Co. Latest operation is 3 Childress, in the William Fisher Survey. This contractor also is starting another test under its own name at an outpost location in the Midway Lake field, same county. The latter test is 1 Old, in the John Ramsey Survey.

ACTIVE ROTARY RIGS*

(United States and Western Canada)

Area—	Week ended 1-21-52	Change week ended 1-14-52	Change week ended 1-22-51
Gulf Coast	628	—23	+ 93
W. Tex.-N. M.	1,043	— 2	+325
Ark.-N. La.-E. Tex.	183	— 3	+ 48
Oklahoma	354	— 3	+ 86
Kansas-S. Nebraska	162	— 5	+ 18
Illinois-Eastern	74	+13	+ 3
Rocky Mountains	165	+ 7	+ 54
Pacific Coast	169	— 6	+ 40
Total United States	2,778	—22	+667
Western Canada	183	+16	+ 79
Total	2,961	— 6	+746

*Courtesy Hughes Tool Co. Trends in drilling activity in the United States and the Rocky Mountains and Western Canada areas are shown on pages 332 and 333.

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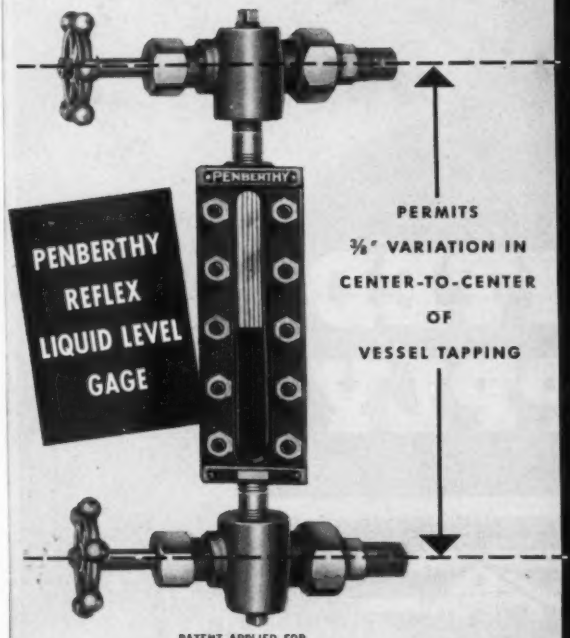

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Saves Time and Money in Gage Installation

A feature available only on Penberthy drop forged steel (and alloy) gage valves, the "floating shank" automatically compensates for as much as ⅜" variation in the center-to-center distance of the vessel tapping. This saves time and cuts the cost of gage installation . . . eliminates stresses often induced during mounting. Penberthy "floating shank" is available at slight additional cost. It will pay you well to specify "floating shank" on your next gage order.

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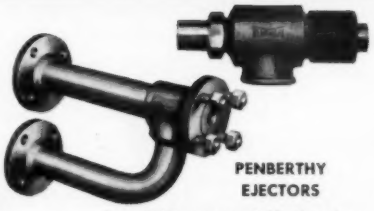

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REFINING

Contract Let

Southwestern to modernize Corpus Christi refinery

CORPUS CHRISTI.—Southwestern Oil & Refining Co. has awarded contract for an extensive expansion and modernization program at its refinery here to Refinery Engineering Co., Tulsa.

The program involves construction of a U.O.P. catalytic cracker, gas-concentration plant, polymerization plant, and product treater. Designed capacity will be 5,740 bbl. of gas-oil charge per day at 50 per cent conversion.

The way will be left open for increasing production in the future by making initial capacity of the blowers 30 per cent more than required for the carbon burned at design conditions and by installing a fractionating column 1 ft. larger in diameter than required for design operation. Throughput can be increased by changing pumps and adding heat-exchange surface.

Operation.—The gas-concentration unit will be the conventional two-stage compressor unit. Primary absorption will be done with cat gasoline and secondary absorption by the light recycle stream from the cat cracker. Overhead from a conventional deethanizer stripper will recycle into the primary absorber.

Design incorporates only one fractionating column. The bottom stream consists of debutanized cat gasoline, and the overhead is propane-propylenes and butanes-butylenes for charge to the polymerization plant.

A depropanizer and a debutanizer will handle fractionation in such a manner that selective polymerization of the propylenes can be carried out later by splitting the propane-butane charge streams.

Debutanized cat gasoline will be sweetened by contacting with caustic in a two-stage system.

Gulf Awards Contracts for New Units at Port Arthur

PITTSBURGH.—Gulf Oil Corp. has let contracts for installation of a polymerization plant and a new sulfuric acid plant at its Port Arthur, Tex., refinery.

Contract for the acid plant was let to Leonard Construction Co., Chicago, and for the polymerization plant to Bechtel Corp., San Francisco. Construction of both units is expected to get under way within 3 months and be completed this year.

The acid plant will produce about 300 tons of sulfuric per day, boosting the refinery's acid capacity by 150 per cent. It will utilize the contact method of manufacture and will include acid-sludge decomposing units for processing spent acid.

The company said the new acid unit will make the refinery largely self sufficient as to acid supply.

The new poly unit, using a phosphoric acid catalyst, will manufacture high-octane gasoline from propylene, currently being used as fuel gas at the refinery.

Carbide & Carbon Plans Polyethylene Resin Unit

TEXAS CITY, Tex.—A $60,285,000 expansion program at Carbide & Carbon Chemicals Co. will be kicked off by the immediate construction of a polyethylene plastic resin unit here, the first of six major units to be built.

H. M. Ross, plant superintendent, said three new buildings will be built on 8 acres recently added to the plant area. Expansion of existing gas-separation facilities is also contemplated for providing raw materials to the unit.

Estimated production of the unit is 50,000,000 lb., which is roughly a quarter of the projected 1952 national output. Ross said the production is expected to begin early in 1953.

The production process will involve direct polymerization of ethylene at high pressure. The resulting "solidified" material will be in the form of whitish, resin granules.

A certificate of necessity authorizing construction of the new facilities has been issued by the National Production Authority.

Arrangements Completed for W.P.R.A. Regional Meeting

BEAUMONT, Tex.—Arrangements have been completed for the first regional meeting of the year of Western Petroleum Refiners Association. The 2-day technical-industrial-relations session will be held at the Edson Hotel here February 7-8.

Among technical papers to be presented on the second day of the meeting will be: "Significance and Interpretation of Bureau of Mines Routine Crude Analysis," by C. M. McKinney, U. S. Bureau of Mines, Bartlesville, Okla.; "The Stability of Present Day Gasolines," by R. O. (Dick) Bender, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.; "Catalytic Unit Reactor Failure," by Vernon G. Ploeger, Baytown refinery, Humble Oil & Refining Co., Baytown, Tex.; and "Sulfur Recov-

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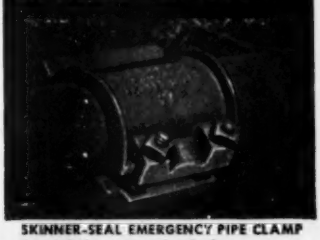
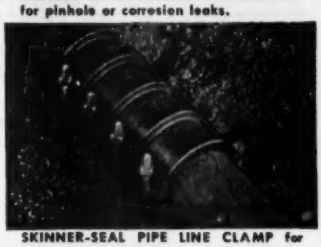


SKINNER-SEAL EMERGENCY PIPE CLAMP for pinhole or corrosion leaks.



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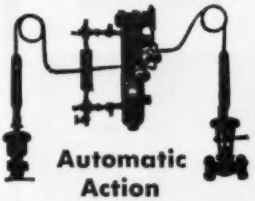

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Inferno Automatic Boiler Safety Units give three positive actions for safety: (1) Inferno feed water control valve automatically controls supply of water to boilers, holds water level at any desired point above crown sheet. (2) If water supply fails and water level falls 1" below set level, Inferno automatic alarm blows shrill whistle calling the fireman. (3) If whistle is ignored, a further drop of 1" in water level causes Inferno fuel cut-off valve to close, automatically cutting off fire before any damage can be done. Bulletin 15-B explains it in detail. Sold through regular supply stores.

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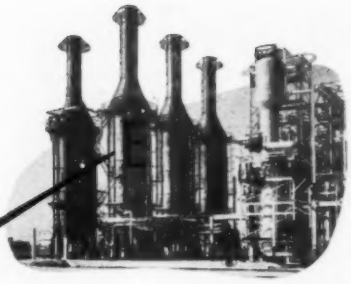

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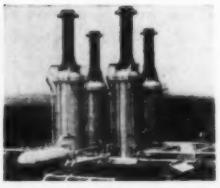

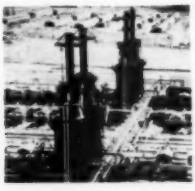

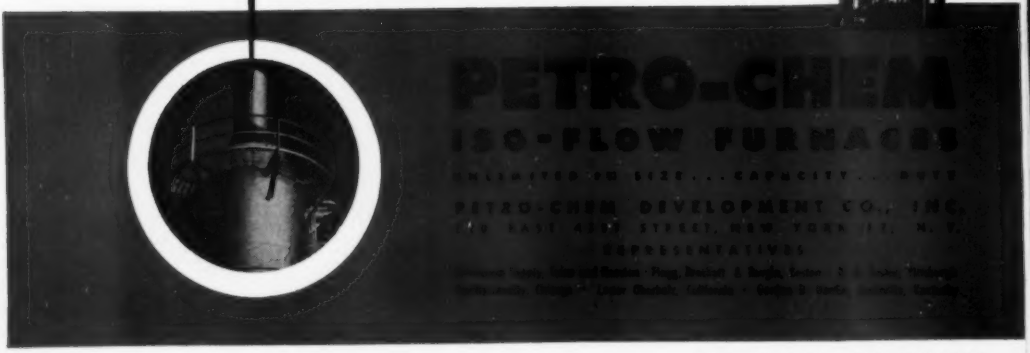

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ery," by J. L. (Dock) Parker, Girdler Corp., Tulsa.

Wilmington Petrochem Plant To Produce Phenol, Acetone

WILMINGTON, Del.—Hercules Powder Co. is entering the petrochemical field with plans to construct a plant here to synthesize phenol and acetone from benzene and propylene by a newly developed oxidation process.

The plant, capacity of which was not announced, is scheduled for completion in 1953. It will rely on local sources of basic chemicals available from refineries and coke ovens in the Philadelphia-Wilmington area.

The new oxidation process was developed by Hercules and Distillers Corp. of Edinburgh, Scotland.

Vickers to Expand Potwin, Kans., Refinery Capacity

WICHITA. — A multimillion-dollar expansion program has been announced by Vickers Petroleum Co., Inc., here, for doubling capacity of its Potwin, Kans., refinery, construction of new offices, and building of a 13-mile, 8-in. products pipe line from Potwin to El Dorado, Kans.

The Potwin plant's present capacity is 5,000 bbl. daily. It will be doubled within the next year by addition of a complete processing unit, including feed preparation, catalytic cracker, and gas-recovery facilities.

Contract for engineering and erection of the new facilities has been let to Southwestern Engineering Co., Los Angeles. Working with Socony-Vacuum Oil Co., Inc., Sweco has designed the complete unit, known as Sweco Packaged 6M T.C.C. unit, and vessels and heat exchangers will be completely fabricated in the engineering firm's Los Angeles shops. They will then be shipped to Potwin for erection, according to William O. Jacobs of Sweco.

New Cutting Oil Developed

A new type of cutting oil has been developed by Gulf Research & Development Co. and is being marketed under the name of Hi-Jet. It is designed for use with a new method of cooling and lubricating cutting bits of machine tools which was developed by R. J. S. Pigott, director of Gulf's engineering division. The common practice in the past has been to flood both bit and workpiece with large quantities of oil, but in Pigott's method the special oil is shot under the cutting edge of the bit through a nozzle. Gulf claims less oil is required and that machining speed is increased and the life of bits prolonged by the new method.

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NATURAL GAS

Gas Firms Hit

Profit margins narrowed by spiraling field prices

NEW YORK. — Natural-gas companies are being squeezed between rising field prices for gas and the regulated return from their own sales. The situation of Southern Natural Gas Co. in this respect was described here last week by C. T. Chenery, company chairman.

During the 12 months ended last November, Southern Natural had an average gas cost of 6.53 cents per thousand cubic feet. This year, the figure is expected to rise to 8 cents, to 10½ cents in 1953, and to 11 cents in 1954.

Chenery said the company is entitled to a rate increase to offset this increasing cost, and "to the extent that there is a time lag in securing it, there will be a reduction in earnings," he told the New York Society of Security Analysts.

Last year, the price paid to different gas suppliers ranged from 4.62 cents to a high of 11.90 cents. Referring to the 11-cent average price which the company anticipates it will be paying in 1954, Chenery said his company would be "pleasantly surprised if we can buy well-located gas for future delivery at a price within gun shot of this figure."

Southern Natural's average sales price is 18¾ cents for all its gas, Chenery said, giving it a margin of about 12¼ cents over the last year's average cost. Of this, about 4 cents is paid in taxes, leaving the company about 8¼ cents to cover all its operations, including return on an investment of about $100,000,000.

Remedial plans. — Chenery said the company is planning two steps to obtain the increase in its gas sales price. It will file an increase on direct industrial sales of about 50 billion cubic feet annually. These sales are not subject to Federal Power Commission approval. It also will ask a rise in rates for general service which are under FPC control.

The company's 1952 earnings are contingent on its ability to obtain sufficient rate relief to permit earnings to continue at the present level of about 6 per cent of regulated sales.

During the last 2 years, Chenery said, Southern Natural Gas has increased its deliverability from 420 million cubic feet to 623 million cubic feet daily.

Sulfur Plant Planned

ALBUQUERQUE.—Imperial Sulfur & Acid Co., Albuquerque, is planning to construct a 60-ton per day sulfur-recovery units in the San Juan basin of northwestern New Mexiso.

The plant will receive acid gas from the nearby 54,350-gal. per day natural-gasoline plant recently completed by El Paso Natural Gas Co. Pilot-plant tests conducted at Farmington, N. M., by Graff Engineering & Equipment Co. were recently completed to demonstrate the feasibility of recovering sulfur from an acid gas containing less than 5 per cent of hydrogen sulfide by volume. Graff is working with Imperial on the planned plant.

Texas Takes Stand Against Change in Phillips Ruling

AUSTIN.—Texas has announced its intention to intervene in five cases seeking to set aside the Federal Power Commission's decision last year in the Phillips Petroleum Co. case.

Atty. Gen. Price Daniel, acting on a request from the Texas Railroad Commission, will file Texas' opposition to any change in the FPC ruling.

This decision, announced July 18, 1951, held that Phillips is not subject to FPC jurisdiction on natural-gas sales to pipe-line companies for interstate transportation and resale.

The decision was appealed by Detroit, Kansas City, Milwaukee, Wayne County, Michigan, and the Wisconsin Public Service Commission. The case is pending before the U. S. Court of Appeals for the District of Columbia.

Olin Culberson, chairman of Texas Railroad Commission, said in announcing his action that the FPC attempt to hold the gathering of gas by Phillips made the company a public utility was a rank invasion of state power.

Illinois Dome Said to Be Excellent Storage Reservoir

CHICAGO.—Herscher dome, a huge natural trap underlying about 15,000 acres in Kankakee and Iroquois counties in Illinois, could prove to be one of the world's best gas-storage reservoirs, it was revealed in recent hearings before the Illinois Commerce Commission.

First detailed analysis of the structure's storage potential was presented at the hearings by four oil and gas consultants and engineers in support of the application of Natural Gas Storage Co. of Illinois to develop and operate the project.

Chief witness was Max W. Ball, Washington geologist and consultant. Others testifying were Mark V. Burlingame, operations vice president of Natural Gas Pipeline Co. of America and Texas Illinois Natural Gas Pipeline Co.; Carl A. Bays, consulting geologist and geophysicist, Urbana, Ill.; and Douglas Ball, oil and gas engineer and geologist, Washington.

Max Ball, who directed the exploration program in the Herscher area, estimated capacity of the 1,750-ft. Cambrian sandstone reservoir at 90 billion cubic feet—enough to supply all Chicago metropolitan-region applicants for house-heating service. Maximum daily deliverability was estimated at 1.5 billion cubic feet.

Construction of the project will not begin until approval is obtained both from the Illinois body and from the Federal Power Commission where an application is also pending.

Odessa Plant on Stream

ODESSA, Tex. — Sid Richardson Carbon Co. and Odessa Natural Gasoline Co. have placed their new sulfur-recovery plant in operation here and report satisfactory production of elemental sulfur recovered from sour gas produced in the area.

The new plant, designed and constructed by Graff Engineering & Equipment Co., Dallas, incorporates a new departure in sulfur recovery. Liquid sulfur is converted to flake form in a continuous process.

Conveyor-system handling of sulfur in this form eliminates the necessity for bulk storage in a solid block and contributes to the efficiency of handling and shipping.

Financing Hits New Peak

NEW YORK.—A new annual peak of $808,000,000 during 1951 was reached by straight operating gas utilities and pipe lines in total volume of long-range capital financing, according to the American Gas Association. This represents an increase of 6.9 per cent over the $756,000,000 raised in 1950.

Of the $808,000,000 raised last year, a total of $742,000,000 was raised by natural-gas companies, a gain of 4.7 per cent over natural-gas-company financing of $709,000,000 in 1950. This shows that in spite of material shortages the industry's vast construction program continued at its accelerated pace, even with some delays and postponements.

Short Course Planned

HOUSTON.—The general committee of the Southwestern Gas Measurement Short Course, meeting here, has worked out plans for the twenty-seventh annual course, which will be held at University of Oklahoma, Norman, April 8-10. Problems pertaining to measurement and regulation of dry and casing-head gas will be discussed during the short course.

STATEMENT OF CONDITION, DECEMBER 31, 1951

RESOURCES

ASH	$78,845,882.74	
NITED STATES SECURITIES	53,205,321.59	$132,051,204.33
unicipal Bonds and Other Securities		5,461,357.27
ans and Discounts	90,914,458.35	
mmodity Loans	18,311,450.00	109,225,908.35
cond National Bank Building (Unencumbered)		1,500,000.00
ture Banking Home Site		753,000.00
her Real Estate		1.00
ults, Furniture and Fixtures		1.00
erest Accrued on Investments		541,979.42
stomers Liability Under Letters of Credit		11,959,525.19
stomers Liability Under Acceptances		4,491,001.48
her Resources		3,853.94
		$265,987,831.98

LIABILITIES

Capital	$5,000,000.00*	
Surplus	5,000,000.00*	
Undivided Profits	4,670,228.35	$ 14,670,228.35
(Effective Jan. 2, 1952, Capital $7,500,000, Surplus $7,500,000)		
Reserved for Dividends		250,000.00
Reserved for Taxes, Interest and Other Purposes		1,785,142.72
Letters of Credit		11,959,525.19
Acceptances		5,391,928.43
DEPOSITS:		
Individual, Firm and Corporation	174,465,427.78	
Bank (Net)	53,596,101.68	
United States	3,869,477.83	231,931,007.29
		$265,987,831.98

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. . . effective January 2nd, 1952. This increase in capital has been accomplished through a stock dividend of 25% and the sale of 62,500 additional shares of 40 dollars per share. This stock has been over-subscribed. The response from our stockholders is evidence not only of their progressive spirit but of their attitude towards the stock as a good investment.

This increase in capital funds will add substantially to the bank's ability to adequately serve its customers. To Houston and the Southwest we wish to express our sincere appreciation of the privilege of serving and to pledge our best efforts in the continuation and expansion of our service.

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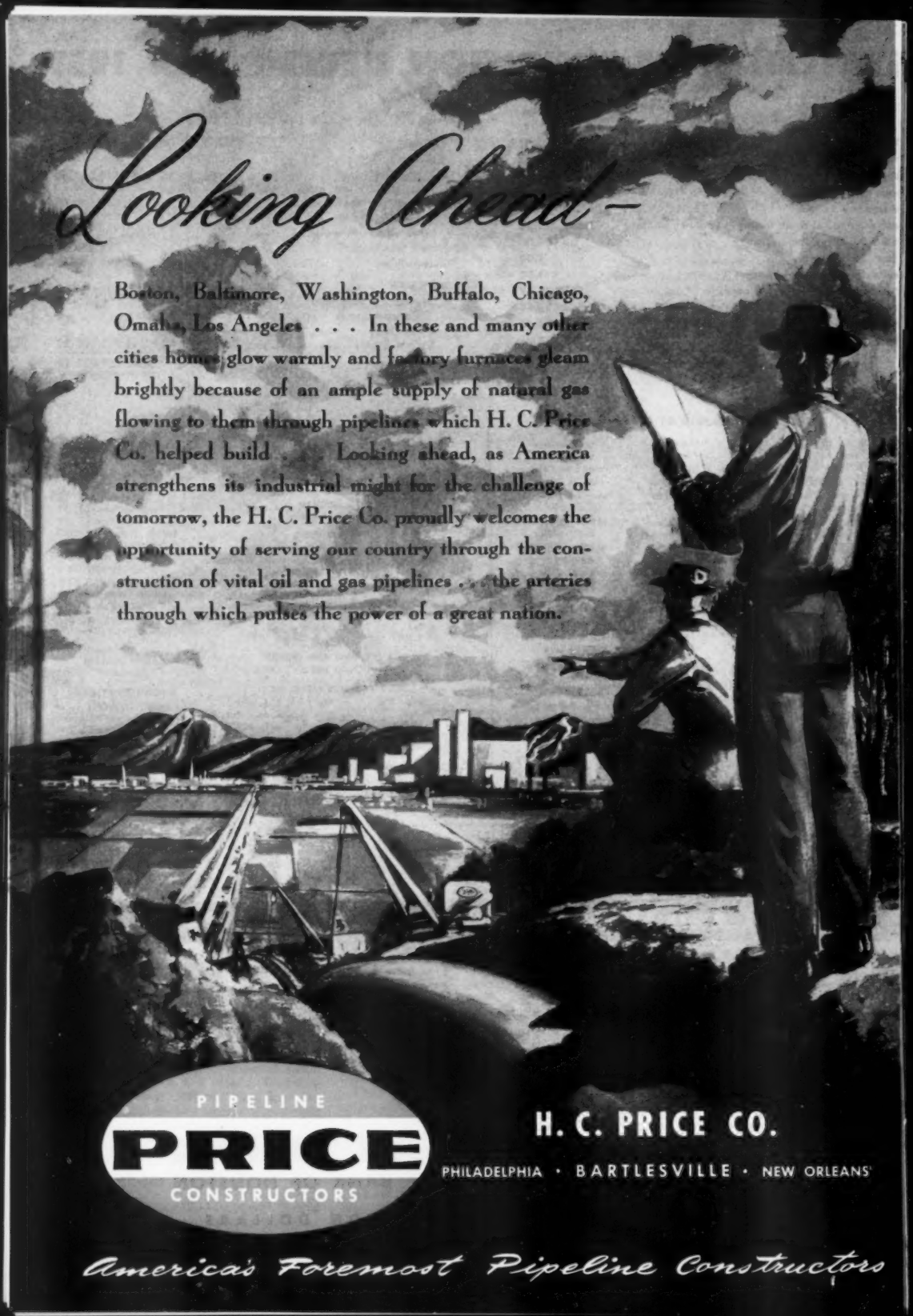
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PIPE LINES

Rancho Program

Firms will start laying pipe line in the spring

HOUSTON.—Rancho Pipe Line System is expected to get under construction this spring with laying of a 455-mile, 24-in., crude-oil line from West Texas to the Gulf Coast.

Prospects for pipe deliveries indicate that work will begin in April, according to H. H. Anderson, vice president, Shell Pipe Line Corp., which will construct and operate the new system for the account of itself and the other six owners. Bids for laying the entire project will probably be requested in February.

Right-of-way is being acquired. Construction of the buildings at the three pump stations will start late in the spring. Operation of the line is expected to begin before November 30.

New entry.—Ashland Pipe Line Co. has recently joined the group which is participating in the ownership of the Rancho System. Ashland thus becomes the seventh owner.

Ownership in the line varies between its two segments; however, the ownerships of the several participants from El Dorado, Tex., into the Houston area are as follows: Shell Pipe Line Corp., 38.07 per cent; Sinclair Pipe Line Co., 20.30 per cent; Pan American Pipe Line Co., 21.31 per cent; Tidewater Pipe Line Co., 5.08 per cent; Nantucket Pipe Line Co., 5.08 per cent; Phillips Pipe Line Co., 5.08 per cent; and Ashland Pipe Line Co., 5.08 per cent.

Tidewater Pipe Line Co. is a wholly owned subsidiary of Crown Central Petroleum Corp. Nantucket Pipe Line Co. is a newly formed successor to Cleveland Pipe Line Co., a wholly owned subsidiary of Ashland Oil & Refining Co.

Capacity.—The projected initial capacity into the Houston area with three pump stations to be located near McCamey, El Dorado, and Austin, Tex., is about 210,000 bbl. daily. It is estimated that the addition of five more stations would bring the line capacity to about 345,000 bbl. daily.

Ozark's Expansion to Be Completed in April or May

HOUSTON.—The five intermediate stations on the Ozark Pipe Line System, owned by Shell Pipe Line Corp. and The Texas Pipe Line Co., were put in operation late in 1951, and it is reported that all of the equipment for bringing the line to full capacity will not be installed until April or May.

At present the Ozark capacity to Wood River and Patoka, Ill., is 260,000 bbl. daily. By April and May capacity will be up to 280,000 bbl. daily.

At about the same time in April and May, Shell expects to install one electric centrifugal pump at each of the five new Ozark stations on its wholly owned 10-in. line.

The capacity of this line, which is now 23,000 bbl. daily with the pump operating at each of the five original Ozark stations, will be increased to 37,000 bbl. by the other five pumps.

The Ozark System is owned 55 per cent by Shell Pipe Line Corp. and 45 per cent by Texas Pipe Line Co. Texas Pipe Line Co. wholly owns the 54-mile, 22-in. extension from Wood River to Patoka, Ill.

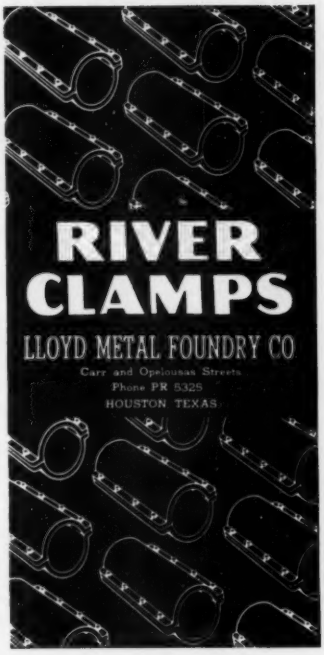
Power Trend

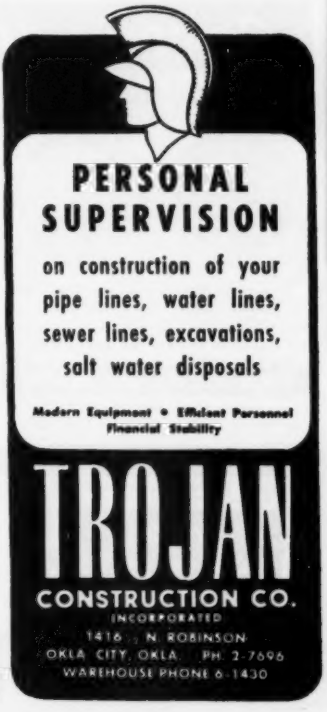
Electricity proving more efficient, Anderson says

NEW YORK.—The use of electric power as the prime mover in operating pipe-line pumping stations is increasing with the trend toward larger pipe lines, the need for faster and more flexible operation, and the adoption of automatic controls, H. H. Anderson, vice president and general manager of Shell Pipe Line Corp., Houston, told the winter meeting of the American Institute of Electrical Engineers here in a review of the history of pipe-line development.

It usually pays to electrify large oil lines if electric power can be obtained at a price not exceeding 8 mills per kilowatt-hour, Anderson said. He reported that Shell has been a proponent of electrification of trunk pipe lines for a quarter of a century and today nearly all of its 54 main trunk-line pump stations are electric powered. The company's annual bill for electric energy is approximately $3,000,000.

The oil industry has to move about 2 tons of petroleum per capita every year, much of it as far as 1,000 miles, and since the war-time experience with the Big Inch and Little Inch pipe lines there has been a decided trend to the use of large-diameter pipe, Anderson pointed out. He explained that large lines have proved to have all the operating flexibility of smaller lines and can transport large volumes of oil more cheaply. As an example, he said, an economically balanced 20-in. or 24-in. line running at full load can move oil at barrel-mile cost about 45 and 36 per cent, respectively, of the equivalent full-





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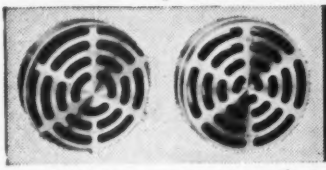

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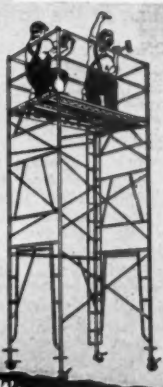

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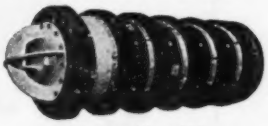

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load cost in a well-designed 10-in. line.

Electrification trend. — He reviewed the trend to electric-motor drive of pump stations, stating that it was due principally to three factors: (1) The increasing reliability of the network electric-power supplies; (2) the continually increasing improvement in the ratio of the cost of electricity versus fuel oil or fuel gas as an energy source; and (3) the recognized advantages of electrified sequence control for operating large pump stations on large-diameter lines.

At large modern stations, with electricity at 8 mills per kilowatt-hour and fuel oil at $2.65 per barrel, Anderson said, the 10-year total capital and operating costs of diesel and electric - motor - driven centrifugal pump stations are about equal, but the distribution of costs varies about as follows:

DISTRIBUTION OF CAPITAL PLUS OPERATING 10-YEAR COSTS

	Diesel drive	Electric drive
	—Per cent—	
Capital investment	26	13
10-year maintenance expense	8	2
10-year operating cost—except fuel oil or electric power	28	13
Fuel oil or electric power	38	72
Total 10-year costs	100	100

Strictly economics.—"Experience has proven that oil and gas engines are quite reliable pipe-line prime movers," Anderson said. "Thus the choice of electric motors versus such engines will remain principally one of economics. On the recently built large Mid-Valley line, diesel engines were installed in those areas where electric power is still a luxury. Your prudent pipe-line operator still hopes to keep the engine manufacturers and the electric-utility companies in cost-minded competition for his business."

In discussing the trend toward use of more automatic controls at pump stations, Anderson said that many lines, particularly products lines, have been equipped with automatic-pressure controls to permit all stations on the line to operate "in step," and thus enable the oil to move from origin to destination without having to enter station balance tanks where intermixture between successive pumpings can occur.

"This condition is essential when segregated batches of different oils are to be delivered without interbatch contamination that may adversely affect the refinability of selected crudes, or the closely controlled specifications of refined products," Anderson explained. "Also, as large gate and stop valves must be opened and closed on larger-diameter lines, it is becoming imperative to use motor-driven valve operators that can be adapted to automatic control.

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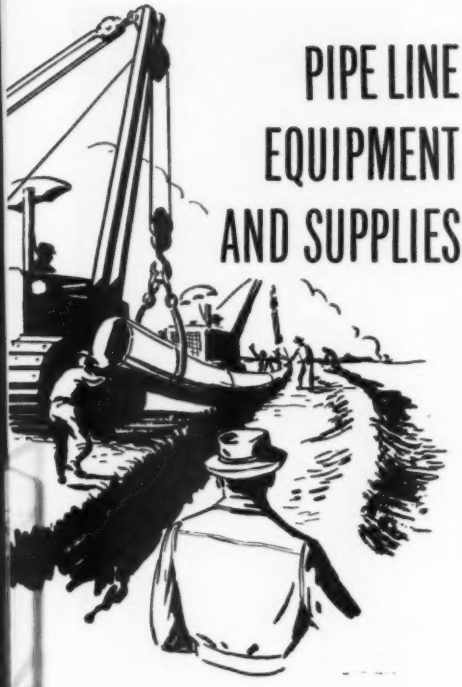

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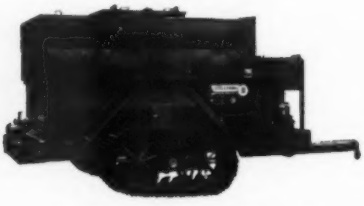

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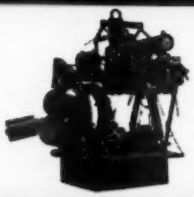

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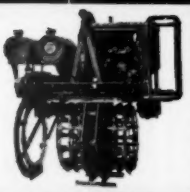

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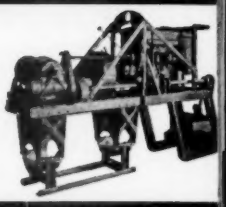

CROSE Auger-Type ROAD BORING MACHINE

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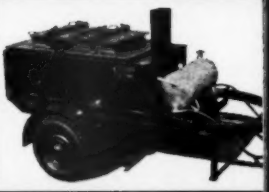

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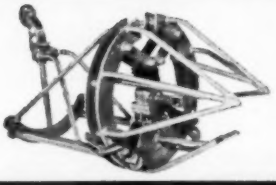

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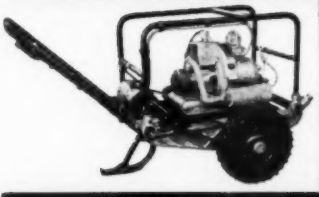

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275,000 bbl. daily over a 1,000-mile route, a revenue of $75.00 per minute depends on getting the line under way. This is attained," Anderson pointed out, "by an investment of only $10,000 in sequence controllers. The mere pressing of three buttons on the console by a single employe will cause the automatic performance of 12 operations in 6 minutes that would otherwise take three husky men an hour to accomplish.

"This means," he said, "a great time saving during service shutdown and startup. Perhaps even more important, however, is the insurance of a foolproof job of starting. Any group of men having 12 critical operations to perform in a required sequence can easily make an error that might cause an accident and further loss."

Conyes Named Head of Pipe Line Contractors Assn.

HOUSTON.—R. A. Conyes, president of R. A. Conyes Construction Co., has been named president of the Pipe Line Contractors Association by the board of directors, succeeding the late A. L. Forbes, Jr., president of Associated Pipe Line Contractors, Inc.

Forbes died the day following his election as president of the association at its convention in Houston.

Conyes had been named first vice president at the convention, according to Richard A. Gump, executive secretary. Maurice S. Williams, vice president of Anderson Brothers Corp., will serve as the only vice president of the association.

Robert Thomas, managing partner of Texas-Louisiana Contractors, becomes the eleventh director of the association, and T. A. Hester, president of Oklahoma Contracting Co., has been appointed by Conyes to be chairman of the labor committee to serve until union agreements for 1952 have been completed.

Three types of memberships have been established by the association: (1) General membership will include general contractors who have previously been designated as active members; (2) special members will include subcontractors engaged in right-of-way work, stringing, coating, etc.; and (3) associate members will include suppliers.

Special members will elect a director who will become the twelfth director on the board of the association. Furthermore, the special members will nominate three men from whom the president of the association will select one to serve on the labor committee.

Honorary memberships have just been conferred on W. G. Hanrahan, O. C. Whitaker, Oscar Dempsey, and John C. Truman. A fifth honorary membership was given earlier to Tennessee Gas Transmission Corp. in recognition of assistance in organizing the association's welding school which functioned on a temporary basis for several months.

The 1953 convention will be held at the Shamrock Hotel, Houston, January 19-21. Provision will be made for both outdoor and indoor exhibits.

Humble Completes Products Line to Petroleum Plant

HOUSTON. — Propane has begun flowing through a 19-mile, 4-in. products line recently completed by Humble Oil & Refining Co. from its London gasoline plant to Texas Eastman Co.'s petrochemical plant 3 miles south of Longview, Tex.

Deliveries during the breaking-in period of the line range from 25,000 to 60,000 gal. daily. They will be increased ultimately to a daily rate in excess of 80,000 gal.

Humble is also supplier of natural gas for plant fuel and is currently supplying 4,000,000 cu. ft. daily from Trawick field in Nacogdoches County. When the chemical plant gets into full operation it will consume more than 10,000,000 cu. ft. of gas per day.

The propane is used as raw material by the plant, which produces principally chemical intermediates to be used as raw materials at Tennessee Eastman's plant at Kingsport, Tenn.

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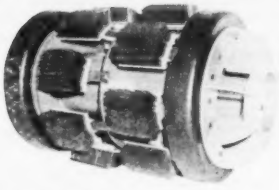

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Similar design 10" to 14" sizes. Will traverse all standard pipe-line gate valves and field bends of approx. 12 ft. radius.

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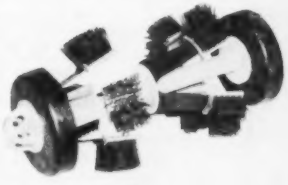
Will traverse all standard pipe-line gate valves and field bends.



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Moose Jaw Basin Looks Up

EXPLORATORY activity in the area of the gentle Moose Jaw syncline of southern Saskatchewan and southwestern Manitoba has developed a number of encouraging signs during the past few months.

This trend for the better took an abrupt upward swing when Socony-Vacuum Exploration Co.'s Roseray wildcat showed for an oil well. This indicated discovery well flowed oil at a rate of more than 350 bbl. daily on a 1-hour drill-stem test of the Lower Cretaceous-Blairmore at 3,096-3,126 ft. Gravity of the oil is around 24°—light for Saskatchewan where production has been restricted to heavy (10°-15°-gravity), black oil in the Lloydminster-Lone Rock area.

The first indication of light oil in Saskatchewan was made last July at Socony-Vacuum 1 Tompkins (A on map) which had a noncommercial showing of light oil and gas in the Jurassic-Hulett at about 3,650 ft. In September Shell Oil Co. 1 Dahinda (D on map) had a noncommercial showing of light 33°-gravity oil below 4,700 ft. in Mississippian (?) rocks.

Shell 1 Big Muddy (E on map) was completed dry in November at 10,233 ft., an estimated 300 ft. short of basement. This wildcat is the deepest hole ever dug in Saskatchewan; previous record was held by North Canadian Oils, Ltd., 1 Ogema, located about 30 miles north of 1 Big Muddy.

Coleville, a heavy (10°-15°-gravity) crude field discovered last September by Royalite Oil Co., Ltd., and Albercan Oil Corp., is being rapidly developed. This Lower Cretaceous-Sparky field now has 16 completed wells, including 1 gas well. In addition to the heavy crude in the 30-ft.-thick Sparky sand, this field has indicated potentialities in the shallower 15-ft.-thick Viking sand as a gas producer. Coleville is on one of the largest seismic features ever surveyed in western Canada and gives promise of becoming a most important black oil development.

There are now three gas wells in the Brock area, which was opened last August by Husky Oil & Refining Co. and Phillips Petroleum Co. 1 Brock for an initial potential of 21 M.M.c.f. of gas daily. The second well, more than 1 mile southeast of the discovery, potentialed 40 M.M.c.f.

to make it the biggest gas well ever completed in Saskatchewan. The third well, ¾ mile north of 1 Brock, has indicated a potential of 8 M.M.c.f. This field, which produces from the basal Upper Cretaceous-Viking (the big gas producer of Alberta), is expected to replace Unity as the largest gas field in Saskatchewan.

The most recent indicated discovery is Sohio Petroleum Co. 1 Elrose. This wildcat, still drilling, tested gas at the rate of 7 M.M.c.f. daily from the Viking. Another gas discovery was recently completed and capped at Dodsland where a Superior Oils, Ltd., et al wildcat tested 1.2 M.M.c.f. on a drill-stem test.

Out of the dozen or so wildcats now drilling in Saskatchewan, only two are shown on the map. These are Shell 1 Wood Mountain (B) and Shell 2 Wood Mountain (C). These wildcats were picked because of their locations in what should prove to be a light-oil area.

Over in Manitoba in the Virden area an oil field is being developed quietly. Four wells have been completed and California Standard, discoverer of the field, is drilling two "field" wells. Canadian Superior of California, Ltd., is drilling a 3-mile stepout to the west of the field. California Standard has three wildcats drilling in the immediate area; they are 7-8 Elkhorn (1 on map), 15-16 Hargrave (2), and 2-21 Linklater (4). California Standard 15-18 Woodnorth Province (3 on map) has been abandoned.

Virden's four completed wells, two of which have been shut in for several months, have produced less than 10,000 bbl. of oil, but judging from the continued activity in the area it appears that more encouragement than meets the public eye is being encountered. Some highly interesting news may be forthcoming from this area which lies over the Mississippian pinchout. *Philip C. Ingalls.*

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

TEXAS GULF COAST.—Two new Wilcox oil discoveries are indicated, one in Washington County and one in Polk County. Jordan Drilling Co. et al. 1 Wiggins, G. S. Thomas Survey, Polk County, has set pipe to test an indicated 18-20 ft. saturated sand topped at 7,850 ft. Tex-Harvey Oil Co. 1 Fred W. Dallas, 6 miles north of Brenham, Washington County, came in flowing an estimated 10 bbl. of oil hourly through ⅛-in. choke from 7,611-13 ft.

ALABAMA.—A fourth oil field seems assured for this state at Humble Oil & Refining Co. 1 A. W. Moye, C NE NW 18-1n-9e, Escambia County. Drill-stem test of the upper Tuscaloosa near 5,945 ft. recovered 29°-gravity oil. (See News Section, this issue.)

WEST TEXAS.—Humble completed its 1 Williams as a Strawn discovery in the southeast corner of Irion County, and one offset and three stepouts were scheduled for immediate drilling. The lower Spraberry sand continued gaining importance, and production, in Reagan County. One dry Spraberry wildcat was flowing oil after operators went back into the hole and drilled to the second sand, and another was ready to complete as a 1-mile offset to a recent lower Spraberry discovery.

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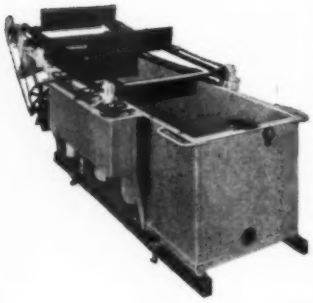

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North Central Texas

New Producer Listed In Young County

WICHITA FALLS.—Week's developments listed one successful wildcat completion and one failure in Young County. The new producer, a Mississippian discovery, was Cox Drilling Co. 1 J. L. Lewis, Section 131, TE&L Survey, about 8 miles northwest of Newcastle and 1½ miles southwest of the Padgitt field. Completion was for 77 bbl. of 41°-gravity oil a day, on the pump, from perforations at 4,355-73 ft.

The failure was Graham Brothers 1-N Allar, Section 3,410 TE&L Survey, in the Young County Regular area. It logged a light oil show from 3,603-40 ft. but was completed dry at 3,640 ft.

In Baylor County, Cosden Petroleum Corp. 1-A Parkey Jr., 8 miles northwest of Megargel, ran casing to bottom at 4,965 ft. after making a drill-stem test rfom 4,935-55 ft. Recovery was 750 ft. of clean oil, plus 30 ft. of oil-cut mud. A second test from 4,955-65 ft. developed 30 ft. of oil.

Concho Petroleum Co., Dallas, had location staked for a 5,500-ft. wildcat in 4-A965-GH&H, 3 miles south of Dundee in Archer County.

In Clay County, L. T. Burns staked location for 2 J. W. Lindeman, 5,600-ft. wildcat 4½ miles southeast of Scotland in Lot 19, Block 2, Clark & Plumb Subdivision.

Continental Oil Co. 1 J. H. Free, Foard County wildcat in the W. C. Hatton Survey, was drilling shale and lime streaks at 8,335 ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT SUCCESSES

Archer County: Rycade Oil Corp. 1 Rasmusen, Sec. 6, Hooper & Wade Sur., TD 5,312 ft., pay 4,394 ft., IP pumped 21 bbl. 43°-gravity oil.

Coleman County: L. H. Choate & Bankline Oil Co. 1 Ballard, E. H. Williams Sur. 4, TD 2,464 ft., elev. 1,812 ft., Morris sand pay 2,449 ft., IP pumped 57.4 bbl. 39°-gravity oil, GOR 600 cu. ft.

Eastland County: John W. Tuttle 1 Brashear, Wm. Van Norman Sur., TD 1,383 ft., elev. 1,479 ft., pay 1,376 ft., IP pumped 11 bbl. 39°-gravity oil.

Jack County: Lone Star Producing Co. 1 F. E. Worthington, J. Worthington Sur., A-2,139, TD 5,547 ft., elev. 950 ft., gas pay 4,978 ft., IP 2,250,000 cu. ft. of gas from perforations at 4,978-88 ft. and 1,580,000 cu. ft. from 5,212-50 ft., 3/8-in. chokes.

Russell Maguire 1 Hensley, John Powell Sur., TD 5,367 ft., conglomerate pay 5,343 ft., IP 81 bbl. 40°-gravity oil, 20/64-in. choke.

Montague County: Cox Drilling Co. 1 E Veretto, 3-A513-MEP&P, TD 6,727 ft., pay 6,658 ft., IP pumped 39 bbl. 40°-gravity oil.

Palo Pinto County: W. R. Hines 1-A Bridges, J. F. Smith Sur., A-410, TD 1,382 ft., pay 1,369 ft., IP 42 bbl. 40°-gravity oil, ½-in. choke, TP 70 psi.

NORTH CENTRAL TEXAS (DISTRICTS 9 7-B) WILDCAT FAILURES

Archer County: B. G. Byars 1-A Virgil Seay, Blk. 36, Harris Subd., dry, TD 1,386 ft.

W. H. Carter 1 Mangold, Blk. 4, P. Harris Sur., dry, TD 2,002 ft.

Continental Oil Co. 1-B Perkins, 42-A12-CSL, dry, TD 1,602 ft.

Hull Oil Co. 1 Anna Mangold, Blk. 18, McKinney & Williams Sur., dry, TD 1,650 ft.

Johnson & Johnson 1 E. L. Pechacek, Blk. 9, Meades LM Pasture Subd., dry, TD 1,445 ft.

Reno Oil Co. 1 Joe, ATNCL Sur., dry, TD 4,041 ft.

Reno Oil 1 Selvyan, 88-2-ATNCL, dry, TD 4,000 ft.

Harrold Shappell 1 Duckworth, Blk. 6, Harris Subd., dry, TD 1,475 ft.

R. Clay Underwood 1 Griffin, Blk. 13, Palo Pinto CSL, dry, TD 2,010.

Baylor County: E. J. Moran 1 R. L. Carpenter, 73-A-BBB&C, dry, TD 5,141 ft.

Callahan County: Humble Oil & Refining Co. 1-B McFarlane, Jedatha Poe Sur., dry, TD 3,660 ft.

Twin Oil Corp. 1 Price Campbell, Sec. 34, BBB&C Sur., dry, TD 2,692 ft.

Clay County: Hassie Hunt Trust 1-B Tom Watson, W. A. Farris Sur., dry, TD 5,512 ft.

Coleman County: Miller & Banks 1 H. Helm, Sec. 9, T&NO, dry, TD 3,620 ft.

Mulberry Oil Co. 1 Armor, 32-2-T&NO, dry, TD 3,923 ft., elev. 2,043 ft., Morris 3,418 ft., Capps 3,452 ft., lower Capps 3,540 ft., Gardner 3,722 ft.

Garrett M. Smith 1 Blair, 20-1-GH&H, dry, TD 2,819 ft., elev. 1,827 ft., Morris 2,568 ft.

Tri-M Production Co. 1-D Dunman, Sec. 2, W. E. Roddan Sur., dry, TD 3,750 ft.

James L. Young 2 Gussie Wise, Sur. 275, dry, TD 1,490 ft.

Cooke County: J. J. Lynn 1 P. M. Endres, F. H. Hamilton Sur., dry, TD 2,664 ft.

W. F. Russell 1 J. F. Nue, E. Yeaman Sur., dry, TD 2,377 ft.

Eastland County: J. J. Lynn 2 C. C. Pippen, Sec. 3,170, TE&L Sur., dry, TD 4,121 ft., Caddo 3,690 ft., Ellenburger 4,080 ft.

Slick-Moorman Oil Co. 1-A Lora Norris, Lge. 3 and 4, McLennan CSL, dry, TD 2,500 ft.

Haskell County: Leo G. Davis 1 Charles Donohoe, Sec. 12, BBB&C Sur., dry, TD 2,608 ft.

G. E. Kadane 1 Gilliland, Sec. 5, H. C. Campbell Sur., dry, TD 4,736 ft.

Walter L. Parr 1 J. C. Allison, 63-1-H&TC, dry, TD 5,813 ft., elev. 1,682 ft., Caddo 5,695 ft.

Skelly Oil Co. 1 Mamie Stewart, Samuel Chance Sur., dry, TD 5,820 ft., elev. 1,462 ft., Ellenburger 5,764 ft.

Roy H. Smith 1 J. T. Hester, J. Scott Sur., A-368, dry, TD 4,115 ft., elev. 1,595 ft., Palo Pinto 3,540 ft., Strawn 4,064 ft.

Jack County: B. F. Allison 1 Callie Conner, E. R. Poole Sur., dry, TD 5,200 ft.

E. T. Maynard 1 Laird, J. T. Dawson Sur., dry, TD 4,535 ft.

Jones County: Lester & Duffield et al 1 L. Hedrick, J. M. Long Sur., dry, TD 3,455 ft., Hope 3,124 ft., Gunsite 3,257 ft., Swastika 3,383 ft.

B. C. McMordie 1 Basland, Sec. 180, BBB&C, dry, TD 2,053 ft.

Randall G. Piper 1 L. K. Hyer, Sec. 8, Lge. 360, Goliad CSL, dry, TD 5,318 ft., elev. 1,910 ft., Dothan 2,619 ft., Noodle 2,865 ft.

R-H-K Drilling Co. 1 Nellie Morris, I Miley Sur. 281, dry, TD 4,567 ft.

Montague County: Larson & Thomas 1 Joe Benton, R. Gamble Sur., dry, TD 6,160 ft.

Paul C. Teas 1 Amanda Stinnett, Francesco Escobar Sur., A-216, dry, TD 4,396 ft.

Palo Pinto County: R. W. Fair 1-27 Clara Watson, 27-2-T&P, dry, TD 4,069 ft.

Errol C. Holt 1 Pat Dalton, C. A. Dalton Sur., dry, TD 1,778 ft.

Wilcox Investment Co. 1 C. Anderson, 2-1-T&P, dry, TD 1,565 ft.

Shackelford County: Anderson & Word-Piper et al 1 W. R. Matthews, 100-10-ETRR, dry, TD 1,860 ft.

Henry Homes 1 A. E. Loenig, Sec. 68, LAL Sur., dry, TD 4,314 ft., dolomite 4,284 ft.

Stephens County: J. E. Connally 1 E. S. Curry, Sec. 2,032 ft., TE&L Sur., dry, TD 2,409 ft.

L. E. Gilbreath 1 L. M. Crowley, 17-6-T&P, dry, TD 2,187 ft.

Marshall P & S Co. 1 A. W. Brazda, 64-6-T&P, dry, TD 2,502 ft.

Miami Operating Co. 1 C. D. Dickie, Jacob Kyle Sur., dry, TD 4,628 ft., Caddo 3,784 ft., Mississippian 4,584 ft.

Taylor County: Bay Petroleum Co. 1-A Dunman, GH&H Sur. 127, dry, TD 3,932 ft., elev. 1,850 ft., Caddo 3,863 ft.

Central Natural Service Co. 1 W. T. Sherrell, Wm. Vaughn Sur. 107, dry, TD 3,687 ft., elev. 1,924 ft., Cisco 2,817 ft., Palo Pinto 3,671 ft.

N. R. Hunt 1 Lela C. Smith, J. M. Beck Sur. 42, dry, TD 3,775 ft.

O. W. Killam 1 Arthel Henson, Sec. 62, LAL Sur., dry, TD 4,880 ft.

S. B. Roberts et al 1 B. L. Boid, 15-18-T&P, dry, TD 3,219 ft., elev. 1,868 ft., Flippen 2,782 ft., Swastika sand 3,162 ft.

Throckmorton County: Pan American Production Co. 2 Watt Matthews, S.A. University Sur., dry, TD 6,048 ft., Ellenburger 4,940 ft.

Young County: John H. Wilson 1-J S. R. Jeffrey, Sec. 43, TE&L Sur., dry, TD 808 ft.

Louisiana-Arkansas

Good Oiler Found in McKamie-Patton Field

SHREVEPORT.—A rich producer has been completed in the McKamie-Patton field by the Carter Oil Co. at their C-216 1 McKamie-Patton unit, 34-17s-24w, Lafayette County, Arkansas.

Producing from the Smackover lime from perforations at 9,451-53 ft., the well flowed 636 bbl. oil daily through a $\frac{3}{8}$-in. choke.

At another Lafayette well The California Co. is taking A-1 sidewall samples at their prospective strike, 1 P. D. Burton, Jr., C NE NE 9-18s-13w.

A drill-stem test of the Smackover lime at 9,382-9,564 ft., was made, using $\frac{1}{4}$-in. chokes and 3,000 ft. of water cushion. Fifty feet of mud with no show recovered. Total depth is 9,564 ft.

Pay string setting position has not been determined. A plug back to test the Cotton Valley is expected, where 4,100 ft. of 43°-gravity oil were recovered in a drill-stem test at 8,335-55 ft.

The first attempt at confirmation of newly discovered Artesian field in Calhoun County will begin soon at Alcan Oil Co. 2 Freeman Smith, 180 ft from SL, 990 ft. of EL, NE 17-15s-13w.

The operator will seek production from the Meakin at 2,580 ft. Well is now producing by pumping at rate of 25 bbl. 16°-gravity oil daily from perforations 2,561-76 ft., opposite oil sand topped at 2,560 ft.

Louisiana.—East Haynesville field in Claiborne Parish has a 156-bbl. producer. The well is A. F. Akin et al 1 H. H. Akin, 16-23n-7w. From perforations at 5,169-97 ft. in the Birdsong and Owens sand the well produced 156 bbl. of 42°-gravity oil daily, using 16/64-in. choke. The total depth was 5,197 ft.

Placid Oil Co. 1 Southern Advance Bag & Paper Co., 3-15n-6w, in Lucky field of Bienville Parish, is making 3,600 M.c.f. gas daily open flow. Flow was from Pettit lime perforations at 7,002-38 ft., after perforations had been acidized with 4,500 gal. acid.

A new Smackover lime oil field discovery in Claiborne Parish is foreseen. The well is Magnolia Petroleum Co. 1 A. Wasson, C NW SE 13-22n-5w, 1 mile southwest of Summerfield. The prospective discovery is $2\frac{1}{4}$ miles northwest of the North Lisbon field, which produces from the Hosston, Schuler, and Smackover horizons.

A-1 sidewall samples from 10,198-10,212 ft. have good showing of oil, and the operator is coring ahead below 10,456 ft. despite no further showings in cores below 10,306 ft. Samples show the top of the Smackover at 10,198 ft.

Hico-Knowles gas-distillate field has a 151-bbl. producer in the new Woodruff oil sand. The well is D. E. Vasser 1 Dubach State Bank et al, 25-20n-4w, Lincoln Parish. Official gage of the 151-bbl. oil show it to be 26° gravity. From perforations at 4,936-60 ft. well flowed through 16/64-in. choke. Total depth was 4,987 ft.

ARKANSAS WILDCAT FAILURE

Miller County: Carter Oil Co. 1 Luceil Krouse, 620 ft. N and 628 ft. E SWc NW¼ 31-15s-26w, dry, TD 4,553 ft.

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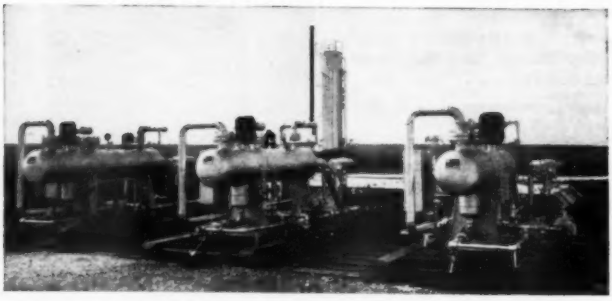

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Permian Basin

Strawn Discovery in Irion County Completed

MIDLAND.—Completion of Humble Oil & Refining Co. 1 Pearl Williams as a Strawn lime discovery in the extreme southeast corner of Irion County has resulted in the immediate starting of one offset and three long stepouts.

Final test of the 1 Williams developed a flow of 311 bbl. of 45°-gravity oil in 24 hours, through 9/64-in. choke, under flowing pressure of 410 psi., and with gas-oil ratio of 176 cu. ft. Tentative top of the lime was 7,230 ft., minus 4,750 ft., and perforations were from 7,230-46 ft. Suggested new field name was South Dove Creek.

A rotary was reported up at Humble 1 R. L. Henderson, 1¼ miles southeast of the discovery, in the northwest corner of Section 1,199, Georgetown Railroad Co. Survey. Pure Oil Co. had drilling under way at 1 J. S. Roach, northwest corner of Section 1,200 and 1 mile west of the 1 Henderson. Stanolind Oil & Gas Co. made location to drill 1 T. C. Meador in the northeast corner of Section 1,216, 2 miles southeast of the discovery. These three outposts are all in Schleicher County. Stanolind had a west offset to the discovery, in Irion County, under way as the 2 Pearl Williams, (formerly designated 1 Williams).

Pay from a deeper horizon was in prospect for the Block 12 field (Permian), of Andrews County at Phillips Petroleum Co. 1-EE University. Drill-stem test in the Devonian from 8,260-8,360 ft. had gas at the surface in 26 minutes. When pipe was pulled after 3 hours and 44 minutes, the well unloaded an estimated 1,500 ft. of clean oil. Recovery in the pipe added 550 ft. of oil and 200 ft. of heavily gas-cut mud. Top of the Devonian was 8,260 ft., on elevation of 3,307 ft. Location is 17-12-University Lands Survey.

Reagan County gained another lower Spraberry producer at Fred Shield 1 Robey, 19-B-L&SU. Location is a 1 mile southeast stepout to Paul Barnhart 1 Patterson, and field sources indicated Robey test slightly higher on Spraberry than Patterson discovery.

After Hydrafrac treatment from 7,503-52 ft. the well flowed load, then made 46 bbl. of new oil in 3 hours through 20/64-in. choke. On elevation of 2,674 ft., it had top of the lower Spraberry at 7,503 ft.

Republic Natural Gas Co. recompleted its 2 American Republics Corp., 6-40-T5S-T&P, on the south end of the Pegasus field in Upton County, as the area's first well in the Spraberry. Nearest Spraberry producer is Humble 1 Tippett, about 13 miles due east.

The Pegasus well had depleted the Ellenburger, and was plugged back to 8,610 ft. Perforations in casing between 7,660 ft., top of pay, and 7,865 ft., yielded 37.8 bbl. of 38°-gravity oil a day on the pump, plus some formation water.

BBM Drilling Co. 1-4 Proctor, 4-C-L&SV, Reagan County wildcat, drilled ahead from old total depth of 7,200 ft. to the lower Spraberry around 7,800 ft. According to field sources, it was flowing 20 bbl. of oil an hour through 24/64-in. choke. A previous drill-stem test between 6,888-6,990 ft. developed 114 bbl. of oil in 48 hours on the swab, which was cutting 10 per cent water.

The 1-4 Proctor was originally completed dry. Top of the first Spraberry sand was 6,882 ft., on elevation of 2,705 ft.

Further study of the Spraberry sand will be made at Mid-Continent Petroleum Corp. 1-U TXL, east-central Midland County, which was dry in the upper Spraberry, with total depth at 7,325 ft. The company has asked permission to deepen to 8,400 ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT SUCCESSES

Sterling County: Honolulu Oil Corp. 1-A Sugg, 55-2-T&P, TD 5,151 ft., elev. 2,600

ft., Spraberry pay 5,130 ft., IP 349 bbl. 40°-gravity oil, 5/16-in. choke, TP 180 psi., GOR 450 cu. ft.

Sutton County: Pure Oil Co. 1 S. H. Allison, 7-B-HE&WT, TD 5,165 ft., elev. 2,282 ft., Pennsylvanian pay 5,120 ft., IP 308 bbl. 32°-gravity oil, 22/64-in. choke, TP 685 psi., GOR 5,600 cu. ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Crockett County: Gulf Oil Corp. 2 Ed Bean, 91-OP-GC&SF, dry, TD 8,400 ft., elev. 2,615 ft., Ellenburger 8,115 ft.

Garza County: Continental Oil Co. 1 Falkner, 42-8-H&GN, dry, TD 3,565 ft., elev. 2,426 ft., San Andres 1,955 ft., San Angelo 2,950 ft.

Glasscock County: Murphy Corp. and Ashland Oil & Refining Co. 1 M. L. Couey, 13-36-T5S-T&P, dry, TD 11,442 ft., elev. 2,699 ft., Spraberry 6,520 ft., Dean 8,015 ft., Strawn 10,162 ft., Devonian 10,885 ft., Ellenburger 11,345 ft.

Placid Oil Co. 1 W. D. Sanders, 24-35-T5S-T&P, dry, TD 8,051 ft., elev. 2,690 ft., Spraberry 6,184 ft.

Midland County: Gulf Oil Corp. 1 John Windham, 32-40-T3S-T&P, dry, TD 13,390 ft., elev. 2,882 ft., Spraberry 7,800 ft., Dean 9,086 ft., Pennsylvanian 10,152 ft., Devonian 11,930 ft., Ellenburger 13,264 ft.

Pecos County: Murphy Corp. 1 H. C. Cole, 19-2-H&TC, dry, TD 5,854 ft., elev. 2,385 ft., Montoya 5,055 ft., Simpson 5,200 ft., McKee 5,822 ft.

Superior Oil Co. 1-A-25 University, 2-25-University, dry, TD 3,103 ft.

Reagan County: Lion Oil Co. 1-D University, dry, TD 7,362 ft., Spraberry 6,448 ft., lower Spraberry 7,349 ft.

Tom Green County: Perkins-Prothro Co. 1-A J. W. Johnson, Blk. 143, Christian Buschel, German Immigration Co. Sur., dry, TD 4,566 ft.

TEXAS PANHANDLE

AMARILLO — Indication of another gas producer for the growing Wheat area of southwestern Gray County has resulted from gas shows on the Phillips 1 Giles "A" outpost well. After showing gas at 2,643 ft., the well had an increase at 2,650 ft. which gaged 1,340,000 cu. ft. Gas is coming from the Permian buff dolomite, pay zone in the field. Present drilling operations on the Giles are below 2,660 ft., with projected depth 3,000 ft.

H. L. Hunt has abandoned three more wildcats in the Palo Duro Basin of the southern Panhandle, and has made location for four others. Abandoned in Armstrong and Donley counties were the 4, 5, and 6 Ritchie estate, with no shows recorded. In Armstrong County locations have been made for the 7 Ritchie, and for the 2 and 3 J. A. Cattle Co. wildcats. The 8 Ritchie is to be drilled in Briscoe County.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Swisher County: Standard Oil Co. of Texas 1 Johnson, 116-M10-BS&F, 12 mi. ENE Tulia, dry, TD 9,218 ft., elev. 3,396 ft., Clear Fork 3,260 ft., Tubbs 3,750 ft., Wolfcamp 5,365 ft., Canyon 7,780 ft., Strawn 8,050 ft., Mississippian 8,600 ft., pre-Cambrian 9,195 ft.

SOUTHEASTERN NEW MEXICO

Jackson, Douglas & Ritchie 1 State, northwest of the Bagley field of Lea County, was drilling below 9,938 ft. Tentative top of the Mississippian was 9,780 ft. Field reports have shown the well to be high on nearly all markers, correlated with nearest production in the Bagley field. Based on the Mississippian top, operators were expecting the Devonian around 10,000 ft.

Buffalo Oil Co. 12-B Baish, deep test in the Maljamar field, topped the Devonian at 13,560 ft., drilled into the formation 2 ft. and prepared to run pipe. It was to be cored ahead.

Other Lea County deep tests included Humble Oil & Refining Co. 1 Federal Elliott, drilling below 13,112 ft. in lime and

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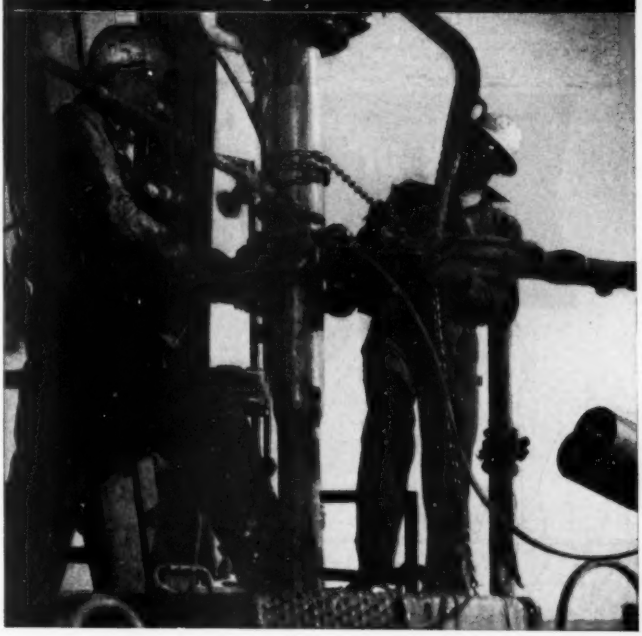

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shale. The Texas Co. 1-AV State, preparing to drill-stem test at 13,435-13,537 ft.; and Wilshire Oil Co. 1 Townsend, drilling lime and chert at 12,602 ft.

In southeast Lea County, J. I. O'Neill, Jr., and Midway Oil Co. made location for a 10,000-ft. Ellenburger test in 36-20s-38e.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Eddy County: Malco Refining Co. 1-A State, 2-18s-27e, dry, TD 8,725 ft., elev. 3,618 ft., Abo 5,140 ft., Wolfcamp 6,530 ft.

Lea County: Lynn-Greer 1 Vinther, 14-3s-30e, dry, TD 820 ft.

Roosevelt County: Tide Water Associated Oil Co. 1 Pat Boone, 7-5s-30e, dry, TD 8,475 ft., elev. 4,412 ft., Tubbs 5,210 ft., Abo 5,950 ft., Mississippian chert 7,930 ft., Silurio-Devonian 8,178 ft., pre-Cambrian 8,398 ft.

Rocky Mountain

Two New Discoveries Seen for Logan County

DENVER—Two new discoveries are apparent in the Denver-Julesburg basin this week, with testing of oil at a new Shell Oil Co. wildcat and recovery of gas on test at the British-American Oil Producing Co. Logan County, Colorado, wildcat. Shell's 1 Rice, NW SW NE 28-8n-53w, recovered gas in 1 minute and the well unloaded oil on test, with 1,900 ft. of free oil, 90 ft. of heavily oil and gas-cut mud and no water on the test. The oil is 38° gravity. Production is from Dakota, topped at 4,756 ft. with the 1-hour test of the zone 4,856-74 ft. Shell found additional saturation in cores of the lower Dakota and is now testing that zone. The wildcat is 3 miles west of the town of Sterling in central Logan County. In the northeastern part of the county, near the Nebraska line, British-American 1 Schwake, NE SW NE 6-11n-52w, found gas with an estimated daily volume of 4 million cubic feet, on tests of the D sand. D sand was topped at 5,144 ft. and the test was 5,147-72 ft. In addition to the gas 405 ft. of salty water, with no oil, was recovered in the 45-minute test.

Both Gulf Oil Corp. and Husky Oil Co.-Wilshire Oil Co. wildcats in the Big Horn basin of Wyoming found oil on tests. The Husky-Wilshire 1 Torgeson, C NE NE 29-49n-93w, Five Mile area wildcat, Big Horn County, made 1,040 ft. of oil, 810 ft. of oil-cut mud, and 540 ft. of mud on 9½-hour test of the Tensleep between 11,629-12,069 ft. Tensleep was topped at around 11,950 ft. and the operators cored some well saturated, porous sand in the formation. Husky and Wilshire are now coring ahead in the Tensleep. This well recovered gas and distillate on drill-stem tests of the Phosphoria, topped at 11,845 ft. The well is northwest of the Worland field, where Pure Oil Co. produces oil from Frontier and Phosphoria but where the Tensleep was hard and tight. At the Gulf Worland prospect, 1 Stockham Federal, C SE NW 2-46n-94w, southwest of Worland field in Washakie County, the well made 100 ft. of 41°-gravity oil, 260 ft. of oil-cut water, 300 ft. of muddy water, and 920 ft. of oil-cut mud on 2-hour test of the fourth Frontier. The well had made some gas on tests of the second and third Frontier sands. This well is also headed for the Phosphoria-Tensleep formations and is now drilling below 10,683 ft.

The California Co. may be planning to abandon the 1 Blanche Thompson, SW SW SE 31-160n-81w, wildcat in Bottineau County, north-central North Dakota. The well is at 8,272 ft., total depth, and California is running velocity surveys after running electric and gamma ray logs. At the present depth the well is believed to be in or near granite and unofficial top of Charles was reported at around 3,865 ft. The well has been a tight hole, with official release of depths only. In South Dakota Shell Oil Co. is running electric log on 1 Winter, C NW SW 11-22n-19e, wildcat in Corson County. The well is at 5,472 ft., total depth, and a test 5,175-96 ft., in Charles, showed 4,820 ft. of salt water in 90 minutes. Top of Amsden was logged at 4,865 ft. and the well has made only water or drilling mud on previous tests. This is Shell's second wildcat, following seismic work, through this area, and a third well is reportedly planned immediately upon completion of the present operation.

Exploratory drilling in southwestern and south-central Utah has been disappointing in recent weeks. Shell Oil Co. has abandoned 1 Unit, NW NW NE 32-39s-23e, wildcat in the Bluff area, San Juan County, after casing parted and the operator was unable to obtain commercial production on tests of the Paradox formation. That zone made carbon dioxide gas with some distillate, a maximum of 11 bbl. daily, after plugging back to 7,635 ft. from the 8,762-ft. total depth. The Glasco-Hathaway Hatch wildcat, N½ SW NE 5-29s-25e, northeast of Bluff, San Juan County, is also being abandoned after going to 7,621 ft., total depth, through Pennsylvanian (?). At Nokai, Skelly Oil Co. 1-A Unit SE NW NW 27-40s-12e, drilling is now under way after a long delay. Skelly's first well was abandoned after a very expensive period attempting to recover lost circulation at shallow zones.

West of this area, in the Kaiparowitz region, The California Co. is now making extensive swab tests at 1 Johns Valley, NE NW SE 22-35s-2w, now at 10,335 ft., total depth. The well is showing a trace of oil from Red Wall (Mississippian) in a zone where the operator had little core recovery and considerable lost drilling fluid. The well swabbed 184 bbl. of fluid in 24 hours, with the trace of oil, and swabbing is continuing. California is drilling below 6,237 ft. at 1 Muley Creek, C NE NE 18-36s-

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10e, Garfield County, which is also projected as a deep test on a well defined surface structure.

WYOMING WILDCAT FAILURE

Converse County, Little Sage Hen anticline: Mountain States Drilling 1 State, NW SE NE 16-30n-72w, dry, TD 1,250 ft., Tensleep 1,250 ft.

COLORADO WILDCAT SUCCESS

Weld County, Keota: Wycolo Development Co. 1 Gillette, C SE 4-9n-61w, pumped 60 bbl. oil per day average, TD 7,404 ft., Niobrara 6,425 ft., Timpas 6,735 ft., D sand 7,242 ft., J sand 7,322 ft.

COLORADO WILDCAT FAILURES

Morgan County, Northwest Greasewood: E. K. Carey Drilling Co. 1 Lissolo, SE SE SW 11-6n-60w, dry, TD 6,900 ft., Timpas 6,249 ft., Codell 6,268 ft., Muddy 6,684 ft., Dakota 6,758 ft.

Washington County, Ward area: Les Bowling et al 1 Ward, NE SW SE 31-1s-53w, dry, TD 5,274 ft., Greenhorn 4,440 ft., Graneros 4,525 ft., D sand 4,762 ft., J sand 4,824 ft., Skull Creek 5,018 ft., Lakota 5,110 ft., Morrison 5,258 ft.

WESTERN NEBRASKA WILDCAT FAILURES

Cherry County: R. C. Gangwer & Co., SE NW SW 28-28n-28w, dry, TD 3,851 ft., Red Beds 3,266 ft., Pennsylvanian 3,540 ft., quartzite 3,706 ft., Greenhorn 2,184 ft., Dakota 2,318 ft., Morrison 3,080 ft.

Cheyenne County: Mitchell Oil Co. 1 Olsen, SE SE SE 23-13n-53w, dry, TD 6,112 ft., D sand 5,556 ft., J sand 5,678 ft., M sand 5,925 ft., Morrison 6,062 ft.

Eastern Texas

Freestone County Wildcat On Completion Potential

DALLAS.—Humble Oil & Refining Co. 1 Anna Watson, Freestone County wildcat west of the town of Yard, reported an open flow of 10,500,000 cu. ft. of gas a day from the Pettit limestone, plus 9.2 bbl. of distillate per 1,000,000 cu. ft. The well was on completion potential, after a week or so of testing.

Humble filed application to drill a southeast stepout to the Tennessee Colony field as the 2 H. R. Hudson, with contract depth of 10,500 ft.

Creslenn Oil Co. has made location to drill a Hunt County Paluxy wildcat in the A. Lyday Survey, A-600. The 5,000-ft. operation was located on a fault-line prospect and is about 2 miles south and slightly west of Cash, on the Boles Orphans' Home land. Creslenn was said to hold some 2,000 acres in the vicinity. Cooper-Herring Drilling Co., Tyler, had derrick up at last report.

The Texas Co. 1 F. L. Allen, confirmation well and southeast offset to the Isaac Lidsey gas-distillate field of Anderson County, (The Texas Co. 1 Hanks), gave the James limestone up after considerable testing through perforations at 10,028-40 ft. The well had been drilled to the Travis Peak. The 1 Hanks made a good distillate well in the James at 10,094-10,104 ft.

In southeast Fannin County, Callery & Hurt 1 Roy G. Robinson, was scheduled for early drilling, to 7,500 ft. Location is south of the town of Ely, in the S. M. Ranier Survey. According to reports, the well will try to establish a southeast trend from the Sherman and Sandusky fields of Grayson County.

In the Sadler-Pennsylvanian field of Grayson County, C. L. McMahon 1 Goodnight completed for a flowing potential of 309 bbl. of oil a day from pay at 6,858-98 ft., through ¼-in. choke. Top of pay was 6,854 ft.

Mid-Continent Petroleum Corp. 1-A Susie Martin was drill-stem testing at 6,906-30 ft.,

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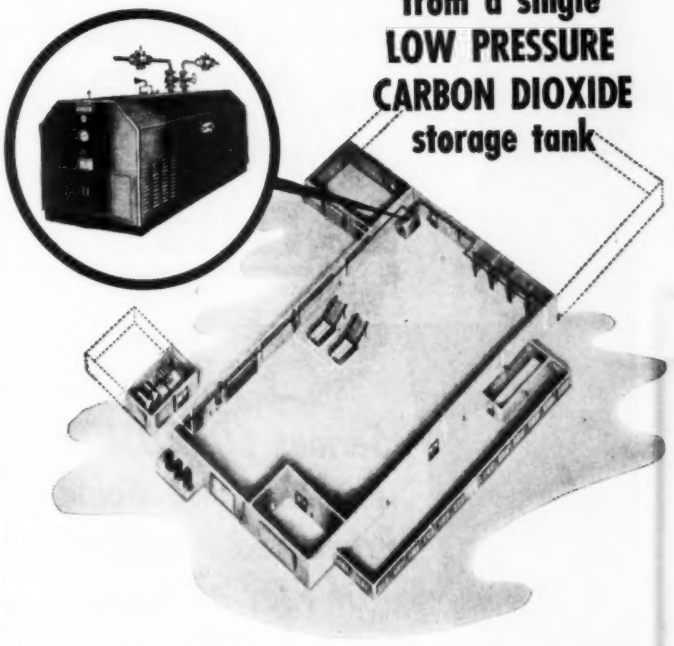

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EAST TEXAS (DISTRICTS 5 AND 6) WILDCAT FAILURES

Cherokee County: W. M. Coats 1 E. Tilley, J. Rineda Sur., dry, TD 4,900 ft.

Kaufman County: T. D. Humphrey 1 Helen Pelt, T. Devore Sur., dry, TD 3,605 ft.

Wood County: Trans Texas Drilling Co. 1 E. D. Keith, W. H. Secrest Sur., dry, TD 5,175 ft.

South Louisiana

New Venture in Lafourche Parish is Completed

NEW ORLEANS.—Callery & Hurt have completed and shut in a new gas-condensate discovery approximately 5 miles north of Chatahoula field in Lafourche Parish. On state potential test, the well flowed 221 bbl. daily through 14/64-in. choke from perforations at 13,617-33 ft. Tubing pressure registered 2,585 psi. Venture is 1 Caldwell Sugars, 19-14s-16e, which was drilled to total depth of 14,014 ft., plugged back and drilled to 13,680 ft. in sidetracked hole. Operator set 5½-in. casing at 13,130 ft. with 4½-in. liner at 13,680 ft.

Magnolia Petroleum Co. 1 Ragley Lumber Co., 29-5s-7w, Allen Parish wildcat, is now bottomed at 18,078 ft. and operator is preparing to run log. This is the deepest well ever drilled in the state.

In Iberia Parish, Shell Oil Co. is preparing to run liner at 1 State Lease 1814, wildcat in Vermilion Bay, 18-17s-6e. Hole is bottomed at 14,732 ft. and operator has set 9⅝-in. casing at 11,000 ft. Electric log was run to total depth.

Although the company has disclosed no information on the test, indications are that drill-stem tests are under way at Humble Oil & Refining Co. 1 L. L. & E. "F" wildcat in the Little Lake gas field of Jefferson Parish. Operator drilled the venture to 12,118 ft. and set casing to 11,836 ft. There was no indication of where drill-stem test would be made, nor were results of cores disclosed. Humble has received permit to drill 2 L. L. & E. "F," a second well for the area. Contract depth calls for 12,000 ft.

The Texas Co. has run a test on 18 United Lands Co., 14-10s-4e, indicated new pay sand discovery in the old Sorrento field, Ascension Parish. From perforations at 7,443-73 ft., the well flowed at the rate of 90 bbl. of 38°-gravity oil daily through 6/64-in. choke. Flow was based on 8-hour test. Gas-oil ratio was 790/1. Operator will continue to test.

The same company is still trying to get a test at 1 State-Shell Point, wildcat in Lake Borgne, Orleans Parish. Perforations were effected at 9,900-25 ft. but packer failed.

Pan American Production Co. has staked location for a northeast outpost to its recent South Pecan Lake field discovery in Cameron Parish. Venture is 4 Miami Corp., 34-14s-3w, which will be drilled to 15,000 ft. The discovery well of the field, 1 Miami Corp., flowed gas condensate from below 12,000 ft.

SOUTH LOUISIANA WILDCAT SUCCESSES

Allen Parish: Oil discovery, "Bolorea"—Niloco Co. 1 Stout Realty Co., 19-6s-7w, TD 7,690 ft., Frio 5,228½-32½ ft., IP: 60 bbl. oil per day, 7/64-in. choke, 24°-gravity.

Cameron Parish: Oil discovery "West Chalkley"—Caroline Hunt Sands 1 Sweetlake Land & Oil Co., 9-12s-7w, TD 11,932 ft., perf. 9,384-89 ft., IP: 150 bbl. oil per day, 10/64-in. choke, 44.4°-gravity, TP 1,050 psi.

SOUTH LOUISIANA WILDCAT FAILURES

Calcasieu Parish: Union Sulphur & Oil Co. 1 S. S. Hunter, Inc., 10-10s-10w, dry, TD 12,201 ft.

Livingston Parish: The Texas Co. 1 Gaylord Container Corp., 4-8s-4e, dry, TD 9,760 ft.

Terrebonne Parish: Callery & Hurt 1 Continental Land & Fur Co., 45-17s-15e, dry, TD 11,041 ft.

Texas Gulf Coast

Two Wilcox Discoveries Seen For Gulf Coast

HOUSTON.—Two new Wilcox discoveries are indicated for the Gulf Coast while another tested salt water in that zone. In Polk County, Jordan Drilling Co. et al 1 Wiggins, G. S. Thomas Survey, Abstract 72, has set pipe at total depth of 8,254 ft. to test the Wilcox topped at 7,850 ft. Reports indicate that 18 to 20 ft. of saturation was logged and a drill-stem test recovered 200 ft. of oil before pipe was set.

In Washington County, Tex-Harvey Oil Co. has apparently opened a good Wilcox reservoir at 1 Fred W. Dallas, located 6 miles north of Brenham. The well came in flowing an estimated 10 bbl. of oil hourly through ⅛-in. choke. Production was from perforations at 7,611-13 ft. Tubing pressure registered 1,075 psi. This well is approximately 1¼ miles northeast of Tex-Harvey 1 Winkelmann which is shut down after indicating production from the Wilcox below 8,000 ft. Workover rig is now being moved in at this well.

Sinclair Oil & Refining Co. 1 H. R. Houch Tr. "A," Colorado County wildcat, flowed gas and salt water on test at 11,324-34 ft. Operator squeezed off these perforations. Meanwhile, Sinclair has plugged 1 Foster Gas Unit, also in Colorado County, a total depth of 10,999 ft. after encountering no commercial shows.

Gulf Oil Corp. has staked location for 1 E. R. Sanders Unit, confirmation test to 1 Gardner, Wilcox oil discovery in Grimes County. New test is approximately 1,500 ft. northwest of the field discovery.

Cities Service Oil Co. has completed 1 D. I. Underwood, rich gas-distillate discovery in Lavaca County. From perforations at 9,673-85 ft., the well made 60 bbl. of 55.6°-gravity distillate plus 1,010,000 cu. ft. of gas. Flow was gaged through 20/64-in. choke.

C. N. Housh has established new pay in the East Hillister area of Tyler County at 1 Citizens State Bank. The well flowed 94 bbl. of 35.6°-gravity oil daily from perforations at 4,887-93 ft. Production was gaged through 7/64-in. choke. Well lies in James E. Burke Survey, Abstract 106.

Robert Mossbacker 1 W. F. Zollner, Colorado County gas discovery, has been potentialed for 5,000,000 cu. ft. of gas daily from perforations at 9,150-62 ft. The well is also flowing fluid at the rate of 30 to 40 bbl. with each million cubic feet of gas. Well is in Section 6 of Johnson & Stafford Survey, A-719.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT SUCCESSES

Goliad County: Oil discovery—M. E. Andraws, Est. 1 Louis Hoff, CEPIM Sur., A-355, TD 4,223 ft., Frio. 3,268-72 ft., IP: 58 bbl. oil per day, ⅛-in. choke, 23.5°-gravity, TP 240 psi.

Jackson County: Gas discovery—Quinto Creek Production Co., Inc., 1 John P. Williams, William Whitaker Sur., A-79, TD 4,648 ft., perf. 3,532-38 ft., IP: 12,000,000 cu. ft. of gas per day.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Austin County: Union Oil Co. of California 1 Huber, Louis Von Roeder Sur., A-309, dry, TD 11,196 ft.

Bee County: Grubb & Gilger 1 C. Stubenthal, J. T. Malloy Sur., A-43, dry, TD 4,967 ft.

Burleson County: M. K. Womack 1 Coffield,

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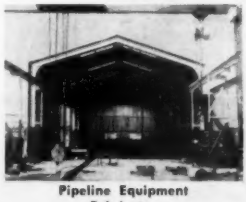

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James Shaw Sur., A-227, dry, TD 6,400 ft.

Fort Bend County: Harold Link 1 Dippel, Robert Hodge League, A-33, dry, TD 5,183 ft.

Shell Oil Co. 1 Anderson, Moses Shepman Sur., A-86, dry, TD 8,682 ft.

Goliad County: Dudley T. Dougherty 1 R. L. Pettus, W. D. Sutherland Sur., A-269, dry, TD 5,050 ft.

Hardin County: General Crude Oil Co. 1 Mothner, Eest. et al, James M. Clayton Sur., A-140, dry, TD 8,200 ft.

Shell Oil Co. 1 Kirby Lumber Corp. Tract 112-A, H&TC RR Sur. 225, A-324, dry, TD 9,066 ft.

Jackson County: Alcoa Mining Co. B-1 W. F. Weed, F. G. Keller Sur., A-37, dry, TD 9,662 ft.

John F. Camp 1 Wofford & Gayle, Henry Smith Sur., A-72, dry, TD 4,117 ft.

Union Sulphur & Oil Corp. 1 E. C. LaBauve et al, Josiah H. Bell Sur., A-7, dry, TD 8,750 ft.

Jefferson County: H. R. Smith et al 1 Miner Unit, F. Bigner Sur., City Limits of Beaumont, dry, TD 8,010 ft.

Lavaca County: Goldrus Drilling Co. 1 E. A. Turk, H. C. G. Summers Sur., A-53, dry, TD 5,715 ft.

Live Oak County: Mills Bennett 1 Thos. McDermott, Mark Killery Sur., A-19, dry, TD 8,003 ft.

Montgomery County: Caroline Hunt Sands 1 San Jacinto Trust Co., Elija Votaw Sur., A-584, dry, TD 10,112 ft.

Victoria County: Hassie Hunt Trust 1 Emmett Fagan, Peter Teal Sur., A-112, dry, TD 5,520 ft.

Wharton County: Gubb & Gilger 1 Knolle, James Tumlinson Sur., A-63, dry, TD 6,250 ft.

Mississippi

Good Wilcox Strike Seen For Adams County

JACKSON.—One of the best Wilcox strikes yet seen in the State of Mississippi has been completed at Barnett Serio Drilling Co. 1 H. W. Carter, 28-5n-1w, approximately 2 miles southeast of Kingston field in Adams County. The venture had a minimum of 11 ft of net effective oil sand between 6,658-69 ft. After perforating above and below the sand and block squeezing to prevent water encroachment, operator perforated the upper 3 ft. of sand at 6,658-61 ft. for completion. The well showed good for 222 bbl. oil daily through ¼-in. chokes. Gravity of the oil was 38.5°.

Details have been released on a drill-stem test conducted at Humble Co. 1 H. C. Spears, 27-1n-6e, Amite County. The wildcat has protection casing set at 11,313 ft. and 5½-in. liner was run to 11,656 ft. The liner was perforated at 11,612-35 ft. Drill-stem test was then run with packer set at 11,109 ft., and using ¼-in. chokes and 3,000 ft. of water cushion. On 25-hour test, fluid rose to within 2,020 ft. of the surface. Operator swabbed and recovery was water cushion, oil and gas-cut mud, and 4,270 ft. of 37.8°-gravity oil. An estimated 30 bbl. of oil were recovered from the test. Test tool has been pulled, but no additional plans for the well have been revealed.

Alabama.—A new oil strike seems assured in the State of Alabama at Humble Oil & Refining Co. 1 A. W. Moye, C NE NW 18-1n-9e, Escambia County. One drill-stem test in the upper Tuscaloosa formation, tool open 24 minutes, the well flowed an ungaged amount of 29°-gravity oil. Test was conducted around 5,945 ft. where the pay was topped. This potential discovery is located 2 miles north of Pollard townsite, and is also approximately 1½ miles east of an abandoned well drilled by Stanolind Oil & Gas Co. the latter part of 1951. The Stanolind well had shows of oil but operator abandoned after failing to produce the sands commercially. This is extremely wild-

cat territory, being the farthest east that oil has been found in the state. If the Humble well is completed as a producer, it will establish the fourth oil field for the state.

MISSISSIPPI WILDCAT SUCCESS

Adams County: Oil discovery "Courtland" —B. Serio Drilling Co. 1 H. W. Carter, 28-5n-1w, TD 7,028 ft., Wilcox 6,658-61 ft., IP: 222 bbl. oil per day, 9/64-in. choke, TP 640 psi., 38.5°-gravity.

MISSISSIPPI WILDCAT FAILURES

Adams County: John S. Callon-Doris Ballew, Inc., 1 Joseph W. Parker et al, 31-7n-2w, dry, TD 6,505 ft.

Wayne County: G. M. & O. Land Co. and Lyle Cashion Co. 1 U. S. A., 1-7n-8w, dry, TD 6,317 ft.

Wilkinson County: Gulf Refining Co. 3 Crosby Lumber Co., 45-4n-2w, dry, TD 7,412 ft.

RR Sur., Blk. A, A-529, TD 6,005 ft., perf. 5,812-42 ft., IP: 2½ bbl. oil per day, ¼-in. choke, 42°-gravity, CP 400 psi.

Jim Wells County: Gas-condensate discovery, "Coopwood"—Bjarne Rossebo 1 Eva Coopwood, Sec. B., R. King Subd., TD 5,900 ft., perf. 5,410-47 ft., IP: 16,500,000 cu. ft. of gas per day plus 11 bbl. of condensate per million.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Caldwell County: John C. Robbins, Jr., 1 A. P. Yates, Dideon Page Sur., dry, TD 2,101 ft.

C. E. Starr et al 1 C. C. Crowell, Gerren Hinds Sur., dry, TD 5,341 ft.

Duval County: Dulaney Oil Co. et al 1 Mrs. Leila Peters, L. Munoz Sur. 2, dry, TD 2,283 ft.

Hassie Hunt Trust, Est. 1 John O'Neil-Clara Driscoll Est., John P. Nelson 486 Sur., Blk. 17, dry, TD 5,515 ft.

Don H. Marsh et al 1 Paul P. Guerra, Copita Farm & Garden Tracts, Jose Marcelo Hinojosa Grant, dry, TD 5,280 ft.

Edwards County: Dan Auld et al 1 Hal and Charlie Peterson, EL&RR Co. Sur. 7, dry, TD 5,090 ft.

Frio County: Carl Lee Oil Co. 1 Emma F. Shiner, Austin & Williams Sur. No. 977, dry, TD 6,058 ft.

Newman Bros. & Alaska SS Co. et al 1 Ed Mann, Geo. Wicker Sur., A-662, dry, TD 4,214 ft.

Hidalgo County: Sun Oil Co. 2 Mary O. Shary, Rio Grande Development Co. Subd., El Melando Grant, Blk. 10, dry, TD 8,007 ft.

Jim Hogg County: John F. Camp & Sons and E. J. Pearl 1 Andrea Garza de Cuellar, Sur. 86, dry, TD 2,122 ft.

Jim Wells County: Bridwell Oil Co. 1 Seaboard Oil Co. et al W. F. Rice Sur., A-400, dry, TD 5,505 ft.

Thomas Jordan, Inc., 1 C. E. Stacy, Sur.

Southwest Texas

Potential Test Run On New Nueces Discovery

CORPUS CHRISTI.—Potential test has been run on a new gas-distillate discovery in Nueces County. H. H. McFarland 1 Kate D. Bluntzer, Share 1-E Bluntzer partition, flowed 3,340,000 cu. ft. of gas daily plus 40 bbl. of 59°-gravity distillate through ¼-in. choke. Production is through casing perforations at 5,848-53 ft. Hole is bottomed at 6,260 ft. and operator set 5½-in. casing at 5,914 ft.

The Texas Co. 2 C. Hoelscher, Jim Wells County wildcat in the Hollow Tree field area, has cemented 5½-in. casing at 5,133 ft. On drill-stem test conducted at 5,054-62 ft. through ¼-in. chokes, recovery was 990 ft. of oil, which was 10 per cent gas-cut mud and 90 ft. of oil-cut mud. Bottom-hole flowing pressure was 1,025 psi. Another test at 5,601-15 ft. yielded 40 ft. of slightly gas-cut rathole mud.

G. R. Schimmel has temporarily abandoned 1 Henry E. McDaniel, Wilson County wildcat which recovered 75 ft. of oil-cut mud on drill-stem test at 2,815-28 ft. Tool was open 30 minutes with recovery being through ¼-in. chokes. Five-and-one-half inch casing has been set at 2,835 ft. in the venture.

Appell Drilling Co. 3 J. L. Dornak, Queen City sand discovery 6 miles southwest of Jordanton, Atascosa County, is shut in preparatory to taking potential. Through 20 perforations from 443-49 ft., the well flowed an estimated 100 bbl. of oil daily. Shut-in pressures were 180 psi. on the casing and 185 psi. on the tubing. The indicated strike was drilled to 1,449 ft. and 7-in. casing cemented at 839 ft.

Morris Cannan 1 A. M. Bruni is awaiting state potential after flowing an estimated 80 bbl. of oil daily from the Lower Yegua formation. This wildcat, located 2 miles southeast of Bruni in Webb County, produced from perforations at 3,933-41 ft. Operator set 5½-in. casing on bottom at 3,964 ft.

Thomas Jordan has filed application to drill a confirmation test to 1 J. N. Bell, oil discovery in Bastrop County, which came in flowing at the rate of 25 bbl. per hour. New venture is 2 H. N. Bell, Jr., Albert Black Survey, Abstract 84.

Howeth & Mason 1 George A. Kemper, Frio County wildcat, which had saturation in chalk, and is now coring at 5,206 ft., may attempt completion tests soon by setting casing in the wet formation. Exact depth of the saturation is not known, however, the well is known to have recovered some oil on drill-stem test at 3,715 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT SUCCESSES

Dimmitt County: Oil discovery—Howeth & Mason 1 George Light, Sec. 67, I&GN

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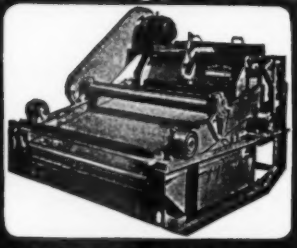
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62, R. E. L. King Orig. Grantee, Sec. 62, dry, TD 5,959 ft.

H. R. Smith-W. C. McBride, Inc., and Progress Petroleum Co. 1 Jacob S. Floyd, Magnolia Fig & Orange Colony Blk. 19, Lot 53, dry, TD 6,526 ft.

LaSalle County: Hassie Hunt Trust 1 Lonnie Jacobs, John S. Holly Sur. 277, A-797, dry, TD 5,925 ft.

Neuces County: Robert L. Siddall 1 Edwin Jurica et al E. Villareal Sur., Rincon Deloro Tract 22, Robertson Farm Tract Sud., dry, TD 5,082 ft.

San Fatricio County: Southwestern Oil & Royalty Co. 1 Ed J. Heuermann, Cubage & Miller Subd. in Edroy, dry, TD 7,015 ft.

Webb County: J. F. Kramer 1 W. C. Rosher, Sec. 518, Blk. 2, H&GN RR Sur., dry, TD 2,500 ft.

Harry E. Murray 1-C M. Adami, BS&F Sur. 339, dry, TD 1,651 ft.

H. R. Smith & W. C. McBride, Inc., 1 Mabel Adami, AB&M Sur. 27, A-303, dry, TD 8,012 ft.

Wilson County: B. Coleman Renick 1 J. M. Woodward, C. Zepeda Sur., A-363, dry, TD 3,015 ft.

Zapata County: Dulaney Oil Co. et al 2 Roman Garza, BS&F Sur. 161, Share 2, Blk. 1, dry, TD 2,170 ft.

Canadian Fields

New Year Ventures Have Good Results in Canada

CALGARY.—The first 2½ weeks in 1952 brought oil or gas discovery at seven exploratory ventures being drilled in western Canada, including three oil and two gas discoveries in Alberta and two discoveries in Saskatchewan, one oil and the other natural gas. One of the Alberta strikes had been chalked up as a "wet gas" discovery in 1951, while another of that province's discoveries found oil in two zones of the Devonian. Western Canada's discovery rate (including both oil and natural gas strikes) for the initial 2½ weeks of this year, is running at around one every 2 days.

The most recent Alberta discovery was made in the D3 zone of Devonian at a wildcat venture in the Red Deer Lake-New Norway area that struck oil in the D2 zone earlier this year. The dual zone oil discovery well, Scurry-Explorers 1 New Norway, on LSD 16, 10-44-22w4, is located 120 miles northeast of Calgary and 4 miles southwest of Devonian oil wells at New Norway. The well found around 111 ft. of D2 zone without signs of formation water, and has to date penetrated 23 ft. of water-free oil bearing D3 zone. Coring and testing operations are being continued.

The discovery well flowed 36.6°-gravity crude oil during two of three drill-stem tests run in the D2 section between 5,085 to 5,122 ft. Two tests in D3 gave oil flows to the surface, while the latter test at bottom 5,273 ft. yielded a pipe recovery of 1,890 ft. of clean oil.

Canada's thickest D3 oil and gas productive reef was found in the Bonnie Glen area of central Alberta by the team of Texaco Exploration Co. and McColl-Frontenac Oil Co., Ltd. That team discovered "wet gas" at its Texaco A-1 Bonnie Glen well last year, and during the first days of 1952 entered a prolific oil column at the well. The well indicated around 688 ft. of D3 Devonian pay zone. Of that section, 397 ft. yielded a high volume of natural gas plus condensate with gravity over 60°, and approximately 291 ft. gave up 42°-gravity crude oil.

The Bonnie Glen discovery well, located on LSD 3, 20-47-27w4, is 30 miles southwest of Edmonton and 6½ miles south of Texaco-McColl's group of nine Devonian oil wells at Wizard Lake. The team currently has three other drillers under way in that oil field.

The Bonnie Glen well, after encountering

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water in D3, completed drilling at 7,120 ft., and crew is now preparing to run string of liner prior to commencement of production testing. Regarded as one of the largest wet gassers in western Canada, the Bonnie Glen well flowed natural gas with accompanying naphtha at rates up to 10,500,000 cu. ft. dolly during drill-stem tests in the D3 gas cap. A natural gas potential considerably higher than that would be expected if the well were allowed to produce on open flow. The D3 oil column yielded crude oil flow rates at between 15 and 20 bbl. hourly during drill-stem testing.

Alberta's other oil discovery that has been recorded so far this year was made by Canadian Gulf Oil Co. at a venture located 2 miles south of the main portion of Stettler oil field. This strike, ¼ mile from a D2 oil discovery well, found its crude in the D3 Devonian zone. The well, Gulf 6 C.P.R.-Anderson, on LSD 6, 27-37-20w4, flowed D3 oil at an estimated rate of 40 bbl. hourly, from a thin D3 section. Crew is currently swabbing the well into production.

The two Alberta natural gas discoveries this year were made in the Viking sand. One, Deep Rock Oil Corp. 1 Bullpound wildcat, found gas at rate of 1,500,000 cu. ft. daily, plus salt water. This well, located on LSD 8, 10-25-14w4, a few miles west of Cessford area Cretaceous gas wells, is now continuing as a test of the basal Cretaceous. In the Beaverhill Lake area, George and Herman Brown of Houston, Tex., struck an estimated 6,000,000 cu. ft. per day gas flow. This well, on LSD 7, 2-51-18w4, has been abandoned, as it encountered only about 3 ft. of gas sand, and there was no available market in the immediate area.

In Saskatchewan, that province's first medium-light crude oil discovery well is being prepared for production testing. The well, Socony-Western Prairie 1 Roseray, discovered 24°-gravity crude oil in the Lower Cretaceous during the first week of this year. Located on farmout lands from Western Prairie Exploration Co., and drilled by Socony-Vacuum Exploration Co., this strike is 70 miles east of Alberta, 350 miles west of Manitoba oil pool at Virden and 28 miles northwest of Swift Current, on LSD 2, 10-17-18w3. This encouraging oil discovery well found some 60 ft. of gross pay zone, and flowed at rate of 370 bbl. daily during drill-stem tests.

Crew has set string of production casing and are awaiting perforating equipment in order to open up the casing opposite the pay zone and commence production tests.

CANADIAN WILDCAT FAILURES

Surety-Mitmore 13-19 Calvan, LSD 13, 19-41-22w4, TD 3,560 ft.

H.B.-Union-Pacific 1 Dunvegan, LSD 8, 8-81-5w6, TD 3,320 ft.

Challenger-Chargrand 1 C.P.R., LSD 11, 7-53-3w4, TD 2,001 ft.

Imperial 5-11 Watt, LSD 5, 11-55-14w4, TD 3,275 ft.

EASTERN CANADA

ONTARIO.—An important gas discovery has been made in Lambton County, Ontario, where Union Gas Co. of Chatham, drilling on the Norman F. Wilson farm, Lot 32, Concession 2, Dawn Township, has encountered gas, estimated 6,500,000 cu. ft. open flow in the Guelph-Niagara limestone, producing horizon of the old Dawn field. Location is about 3 miles northwest of the old field, and close to existing transmission lines. A 800,000 cu. ft. flow developed in the top of the formation which, on deepening to 1,732 ft., was increased to 6,500,000 cu. ft. Stevenson Bros. of Thamesville had the contract, using equipment of W. G. Kiser & Son of Chatham. The discovery was made following extensive preliminary surveys, over 2 years, with geophysical work covering some 804 sq. miles, followed by a series of drilling tests. It is probable a series of offset wells will be undertaken to determine the trend and extent of the field.

Gaspe.—Operations are being resumed on four wells drilled on acreage of Gaspe Oil Ventures, Ltd., and Quebec Oil Development, Ltd., in the Gaspe Peninsula, Quebec.

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The 1 Tar Point is on the Tar Point anticline, fully blanketed by concessions of 10,382 acres. The oil zone is expected in the upper 600 ft. of the limestone. Drilling, resuming from 6,559 ft. was through sandstone, with the final 50 ft. showing traces of lime. Continental 1 Gaspe on the Galt Brook dome, a structure covered by concessions of 17,698 acres, has resumed at 2,250 ft. This structure was previously drilled and acid tested by Continental 1 Gaspe in which a fair commercial production indicated; and the deep test is designed to penetrate the lower oil bearing strata. The 2 Bald Mountain, on the Bald Mountain anticline covering 54,000 acres, is resuming from 2,190 ft. Asphalt base production is expected in an oil-bearing coral reef around 3,000 ft.

Quebec Oil 1 was abandoned in December at 2,440 ft. after 2 years' intermittent drilling hampered by persistent deviation which necessitated frequent shooting and redrilling. Quebec Oil 2 has spudded on the south flank of the structure, where the dip is gentler and drilling conditions more favorable.

Appalachian-Ohio

Good Gas Wells Reported In West Virginia

PITTSBURGH.—Elk district, Kanawaha County, West Virginia, United Fuel Gas Co. 18-6573 S. B. Bare, resulted in 9,549,000 cu. ft. gas, Corniferous lime 5,290 ft., Oriskany sand 5,427 ft., gas 5,436-5,452 ft., TD 5,454 ft. Harvey district, Mingo County, United Fuel Gas Co. 6835 Henry Closterman gaged 1,356,000 cu. ft. gas, Maxon sand, TD 1,533 ft. Big Creek district, McDowell County, Hope Natural Gas Co. 9659 Olga Coal Co., after shot, tested 1,917,000 cu. ft. gas, Berea sand, TD 5,151 ft. Godfrey L. Cabot, Inc., 1343 Pocahontas Land Corp., 2,572,000 cu. ft. gas in this formation, TD 4,702 ft. Lafayette district, Pleasants County, Lago Oil & Gas Co. 1 O. E. Lamp, 1,565,000 cu. ft. gas, Maxon sand, TD 1,777 ft. Union district, Putnam County, Steel Ridge Gas Co. 1 D. D. Capito tested 1,104,000 cu. ft. gas in the Brown shale, TD 4,108 ft. Portland district, Preston County, Hope Natural Gas Co. 9665 J. Paul Martin, elevation 2,308 ft. recorded the Oriskany sand at 5,658 ft. with gas at 5,658-60 ft. and 5,668-70 ft. testing 1,407,000 cu. ft. and is drilling at 5,687 ft.

Garrett County, Maryland, Cumberland & Allegheny Gas Co. 1 C. C. Mason, elevation 2,427 ft. resulted in 205,000 cu. ft. gas, Onondaga 3,692 ft., chert 3,729 ft., gas 3,749-83 ft., Oriskany sand 3,848 ft., TD 3,980 ft. Loch Lynn Corp. 1 Nellie Lee, elevation 2,416 ft., drilling at 3,683 ft. recorded a Tully at 2,822 ft. Roy Fletcher 1 A. W. Killius, elevation 2,450 ft., Onondaga 3,819 ft., chert 3,850 ft., will be reshot from a depth of 3,846 to 3,876 ft. The gas after the first shot tested 330,000 cu. ft.

Unity Township, Westmoreland County, Pennsylvania, Peoples Natural Gas Co. 4003 A. J. Dotterway, elevation 2,094 ft., is drilling at 4,365 ft. Napier Township, Bedford County, South Penn et al, Snee & Eberly 1 Jesse B. Miller, elevation 1,666 ft., is being reacidized. The depth of the hole is 8,987 ft.

MARYLAND WILDCAT SUCCESS

Garrett County: Cumberland & Allegheny Gas Co. 1 C. C. Mason, elev. 2,427 ft., 205,000 cu. ft., gas, Onondaga 3,692 ft., chert 3,729 ft., gas 3,749-83 ft., Oriskany sand 3,848 ft., TD 3,980 ft.

OHIO

The B. H. Putnam et al wildcat on 1 John Klinger, Lot 60, Watertown Township, Washington County, was finished at

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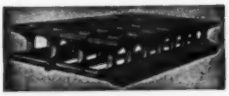

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4,399 ft. with the Oriskany sand reported at 4,348-78 ft. The sand was shot with 90 qt. and in 25 minutes the gage was 2,900,000 cu. ft. when tubing was started in the hole. Rock pressure is 1,675 lb.

The Ohio Fuel Gas wildcat on Daniel Mast in Section 11, East Union Township, Wayne County, is being drilled on down to the Clinton after testing a good showing of gas in the Newburg sand logged at 3,270-96 ft.

Ed Obermiller is drilling on two wildcats in the northeastern area; the 1 T. A. Thornton, Lot 7, Ravenna Township, Portage County, and 1 J. C. Bender, Lot 42, Copley Township, Summit County.

OHIO WILDCAT FAILURES

Medina County, Litchfield Township: Ohio Fuel Gas Co. 1 George Surrarrer, Lot 29, Clinton 2,978-83 ft., TD 2,998 ft.

Perry County, Clayton Township: Waverly Oil Works 1 Levi Masterson, Sec. 26, Medina 3,400-10 ft., TD 3,440 ft.

Oklahoma

McClain County Wildcat Uncovers Deep Oil Zone

PROMISING oil showings have been obtained by Ashland Oil & Refining Co. at its 1 Caviness, a deep wildcat test located in the C NW SE 27-6n-4w, southwest of Criner, in southwestern McClain County. Showings were in what is believed to be upper Bromide.

From cores at 11,996-12,029 ft., operators recovered 3 ft. of sand, carrying oil saturation. Remainder of the core was lime and dolomitic lime. A drill-stem test of the interval below 1,999 ft. yielded 750 ft. of clean oil after the tool had been open 60 minutes. Flowing pressure was 1,400 psi. At latest report, hole was being cored ahead below 12,050 ft., and probably will be carried to its projected depth of 13,500 ft.

Location of the prospective discovery is about 4 miles north of the North Lindsay pool at the north end of the "Golden Trend" in Garvin County.

Continental Oil Co.'s much watched deep wildcat, 1 Kimball, NW NW SW 34-20n-16w, 4 miles southeast of Chester, in southwestern Major County, is drilling ahead below 10,600 ft. after a drill-stem test in Hunton lime. Cores at 10,495-545 ft., where the drill-stem was made, carried good staining and odors. The test, open 75 minutes, yielded only 100 ft. of gas-cut mud with 440 ft. of salt water. It had a flowing pressure of 1,400 psi. and a shut-in pressure of 4,825 psi. after 25 minutes. This wildcat previously encountered substantial gas and distillate showings in the Mississippian lime, topped at 8,384 ft.

Drilling is due to get under way immediately at another confirmation test for Flynn Oil Co.'s discovery well, 1 School Land, north of Beaver, in Beaver County, Oklahoma Panhandle. The new operation, located in the NW NW NE 1-4n-23eCM, ¾ mile southeast of the Flynn well, is J. M. Huber Corp. 1 School Land. Cities Service Oil Co. is drilling an east offset, 1 Miles, SW SW SW 36-5n-23eCM, to the discovery. In the meantime, Flynn is continuing tests at its well to determine the most efficient pumping rates. Some water has shown up on late tests, but the well still has been making more than 140 bbl. of oil daily.

Approximately 25 miles to the southeast in southwestern Harper County, Sunray Oil Corp. has made location for another deep Anadarko basin wildcat, its 1 Wolf, in the C NW NE 4-25n-25w. The location is about 3 miles south of Laverne and about 8 miles southwest of the small Southwest Stockholm pool, nearest production.

Beach & Talbot and associates appear to have succeeded in shutting off the water encountered in early tests at their 1 Muegge, and thus reestablish production in

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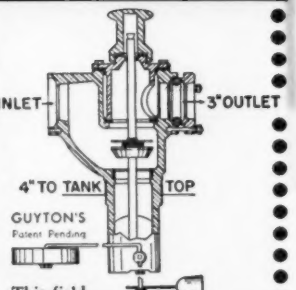

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the abandoned Southeast Lamont pool, in Grant County, northern Oklahoma. The well, located in the SW SE NW 16-25n-3w, ¼ mile east of the original discovery well, flowed 75 bbl. of clean oil in a 10-hour test after cementing first casing perforations and reperforating at 5,350-54 ft. Production is from second Wilcox sand, a new pay zone. Original production, opened in 1937 and now abandoned, was from the Simpson dolomite zone.

Production of the Northwest Schlegel area, 6 miles northeast of Cushing, in Payne County, is being extended ½ mile by Arthur Ramsey at his 1 Robinson, NW NE SE 29-18n-6e. Testing Red Fork sand, topped at 3,136 ft. and opposite which casing is perforated at 3,136-52 ft., the well flowed 2 bbl. of oil per hour through ¼-in. choke after recovering load oil. Total depth is 3,235 ft. with casing at 3,230 ft.

OKLAHOMA WILDCAT SUCCESSES

Haskell County: Superior Oil Co. of California 73-18 Allred, NW SE NE 18-8n-20e, flowed 6,000 M.c.f. gas from Basal Atoka at 5,600-5,630 ft., and Cromwell at 5,995-6,020 ft., TD 7,483 ft.

Love County: Sinclair Oil & Gas Co. 1 Taylor, SE SE SE 33-7s-2w, pumped 50 bbl. 35°-gravity oil from 6,403-18 ft., TD 7,995 ft., PBTD 6,448 ft.

Sinclair Oil & Gas Co. 1 Evans, NE SE SW 34-8s-2e, Swb. and flowed 215 bbl. 45.6°-gravity oil from 4,190-98 ft., TD 6,209 ft., PBTD 4,205 ft.

OKLAHOMA WILDCAT FAILURES

Carter County: B. A. Dillard-W. T. Lucas 1 Sadler, NW SW NE SE 19-4s-1w, dry, TD 708 ft.

Cleveland County: V. A. Brill et al 1 Smith, NE NE NE 22-8n-w, dry, TD 6,526 ft.

Coal County: Harry H. Diamond, Inc., 1 Polk, NE NE SW 6-2n-8e, dry, TD 1,223 ft.

Cotton County: Gene Howell et al 1 Art Smith, NW NW NE 7-2s-11w, dry, TD 2,382 ft.

R. Benton Ross 1 Joel B. Clark, NE NW SE 34-4s-13w, dry, TD 1,865 ft.

Garfield County: A. G. Oliphant 1 Campbell, N/2 S/2 SE 12-24n-5w, dry, TD 6,263 ft.

Garvin County: B. C. D. Edwards et al 1 Carter-Potts, SE NE NW SW 36-1n-3w, dry, TD 1,005 ft.

Lincoln County: The Texas Co. 1 Berry, NE NE NE 32-13n-3e, dry, TD 4,700 ft.

Logan County: Charles H. Mee 1 Schlemmer, NW NW SE 5-16n-1w, dry, TD 5,905 ft.

Love County: Sohio Petroleum Co. and Van Grisso Oil Co. 1 Walker Unit, SW NW NW 29-6s-2e, dry, TD 5,015 ft.

Noble County: Schafer & Associates 1 Toppe, NE NE NE 29-21n-1e, dry, TD 5,287 ft.

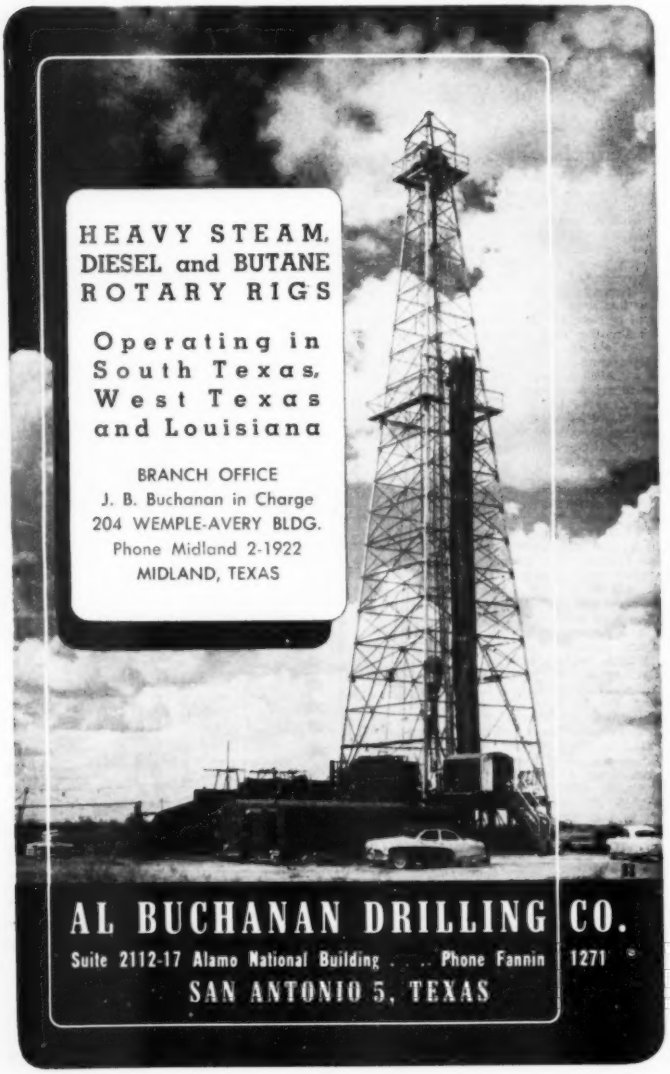
Oklahoma County: Mid-Continent Petroleum Corp. 1 Sasser, SE SE SW 29-14n-1e, dry, TD 5,787 ft.

Osage County: Forrest Lindsay 2, SE NW NW 3-27n-12e, dry, TD 1,520 ft.

Pawnee County: Woods Oil & Gas Co., Inc., 1 Klintworth, NW NW SE 27-20n-8e, dry, TD 2,631 ft.

T. N. Berry & Co. 1 Rogers, SW SW SW 2-21n-5e, dry, TD 3,150 ft.

Pottawatomie County: E. C. Clay & Son, Inc., 1 School Land, SE NW NE 36-6n-2e, dry, TD 4,532 ft.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California

Antelope Hills Productive Limits Extended

LOS ANGELES.—Productive limits of the Antelope Hills field, Kern County, have been extended about ¾ mile northeast by Shell Oil Co. 62X-31 Hopkins. Located in NW NE 31-27s-20e, the extensioner was drilled to 2,850 ft. where it was completed as a small pumper. Data as to volume of production and pay zone were not released by the operator. The well was a west offset to Shell 72-X, abandoned several months ago at a similar depth.

At nearby Blackwells Corner and some 2 miles northwest of North Belridge production, The Texas Co. was preparing to test oil showings in its 1 Occidental Land Co. Located in SW NW Section 8, the wildcat had been drilled to 12,582 ft. before plugging back to 12,005 ft.

In upper San Joaquin Valley, B. B. Breckenridge 1 Georgeson was attracting attention of operators in the Camden area, Fresno County. The wildcat, located about ⅔ mile northwest of nearest Camden production and on the trend established by three producers in the 1-mile long field, was drilled to 6,288 ft. and 5½-in. casing had been set at approximately 6,150 ft. At the weekend the operator was preparing to perforate the interval from 6,000 to 6,059 ft., about the depth at which oil production is found in the field.

A test which will be closely followed shortly will be spudded in the Hollister area of San Benito County. The wildcat, General Petroleum Corp. 1 O'Connell, will be drilled in NW SW 11-12s-4e, or 1 mile north of the recently completed Texas Co. 1 O'Connell. The latter flowed gas at the rate of 320 M.c.f. daily from 5,235-5,710 ft. but was considered as subcommercial and shut in.

At Sansinena production in Los Angeles County, where Union Oil Co. has had a rig constantly at work for the past 3 years, drilling has accelerated. Cause of the increased activity is a shallow sand along the southern flank of the fee-owned property Union is developing. Last September R. E. Bering completed 1 York as a 100-bbl. producer in a 3,200-ft. sand, and since has added four other wells in this and two other shallow pays. Rothschild Oil Co. has two wells under way on its offsetting

Nuckols lease, and Union was preparing to start its 52 Sansinena-Hines.

CALIFORNIA WILDCAT SUCCESSES

Kern County, Elk Hills field, new pool discovery: Standard Oil Co. of California X-55 30-R, NW SE 30-30s-23e, flowed 194 bbl. daily through perforations at 9,309-50 in Carneros zones of middle Miocene, 29°-gravity, 16.5 per cent cut, 1-in. choke, TD 12,856 ft., plugged back to 9,570 ft., elev. 1,332 ft.

New field discovery: The Texas Co. 1 K.C.L.-Goosloo, SW NW 20-29s-25e, flowed 62 bbl. oil and 94 bbl. water from Stevens sand through perforations at 10,027-63 ft., 36.6°- gravity, 12/64-in. choke, TD 10,073 ft., elev. 310 ft.

Los Angeles County, Castaic Hills field, ¼ mile south extension: Richfield Oil Corp. 83-55 Golden, SE NE 35-5n-17w, flowed 300 bbl. daily through perforations at 5,472-5,547 ft., Sterling sand (upper Miocene), 31.5°-gravity, 20/64-in. bean, TD 5,569 ft., elev. 1,425 ft.

CALIFORNIA WILDCAT FAILURES

Contra Costa County, Pettsburg area: John Baldwin, Opr. 1 Baldwin-Soite, 17-2n-1w, dry, TD 5,480 ft., elev. 388 ft.

Kern County, Ant Hill area: A. C. Fisher and J. H. Maurer 9 Linda, 11-29s-29e, dry, TD 1,322 ft., elev. 648 ft.

Jasmine area: Morton & Dolley 1 McDevitt, 24-25s-27e, dry, TD 2,021 ft., elev. 745 ft.

Kings County, Pyramid Hills area: Norris Oil Co. 2 Hand, 29-24s-18e, dry, TD 841 ft., elev. 655 ft.

Los Angeles County, Bartholomaus Canyon area: Bell Petroleum Co. 74-6 Bartholomaus, 6-2n-14w, dry, TD 5,000 ft., elev. 1,298 ft.

Newhall area: Continental Oil Co. 3 Braille, 1-3n-16w, dry, TD 3,835 ft., elev. 1,315 ft.

Placerita Canyon area: V. J. Puccio & C. Doshay 1 Puccio-Doshay, 3-3n-15w, dry, TD 1,200 ft., elev. 2,005 ft.

San Joaquin County, Thorton area: Allison & Prestridge 1 Dinelli, 29-5n-5e, dry, TD 4,070 ft., elev. 16 ft.

A new Devonian discovery is indicated at the western edge of Warren County, near the Logan County line, where Ryan Oil Co. bailed 5 bbl. of oil per day while testing an interval at 1,088-95 ft. in its 1 Norman Potter. The location, in 23-F-35, is about 15 miles southwest of Bowling Green and 5 miles from nearest production. The hole, being drilled with cable tools, is being deepened and may be carried to 1,350 ft.

EASTERN KENTUCKY

In Greenup County 19-X-79 and 2 miles west of Oldtown, Van Everman et al topped Corniferous lime at 1,328 ft. at 1 James West Floyd. Drilled 9 ft. in the formation to 1,337 ft. Hole filled natural at the rate of 1 bbl. oil per day. Operators were shut down pending decision as to whether to acidize pay zone. Test is a wildcat in a county with no commercial production.

One mile north of production in the Oil Springs pool of Magoffin County, several small producers have recently been completed. Bottomed in the Weir sand of Mississippian age at 900 ft. the wells make approximately 2 bbl. of oil daily. Wells are located on Flat Rock, a tributary of Mine Fork.

In the Big Sandy gas field a small oil well has been completed at United Carbon Co. 32 E. J. Evans fee. Maxon sand topped at 1,315 ft. was good for 10 bbl. of oil daily from a total depth of 1,333 ft.

MICHIGAN

The Mineral Springs Dundee oil pool, Sherman Township, Osceola County, was commanding new and perhaps important attention this week as Mogul Oil Co. reported that its 1 Kidder, NE NE SE 20-20n-9w, flowed 60 bbl. of oil in 1 hour and 30 bbl. of oil next 30 minutes through a restricted choke after acid treatment with 250 gal. and before being shut in to allow for tearing down rotary rig and for lack of tank storage.

The 1 Kidder well is the diagonal southeast 20-acre offset to the best producer in the pool prior to its completion and appears to lend support to the current theory that the pool, if one of importance to be developed here, lies to the south-southeast of the discovery and previous development. At the end of 1951, two failures were drilled offsetting production on the north flank of the field which appeared to cancel out prospects for expansion of the reservoir in that direction. The 1 Kidder brings the total number of oil producers in the pool to five, including the discovery. There is an outpost over ½ mile to the northeast of the nearest other well in the field which is being produced, but this well presents somewhat of an enigma since two failures have been completed between it and the original discovery area of the Mineral Springs field. Dundee in the 1 Kidder was logged at 3,862 ft. Hole was drilled to 3,867 ft., total depth, with 5 ft. of pay section drilled starting at 3,863 ft. The permeability and porosity found in the 1 Kidder section appeared to be the best yet drilled in the pool.

Two new offset wells were announced for immediate drilling. Mogul was moving rotary tools to the 2 Anderson, SW NW SW 21-20n-9w, while Rex Oil & Gas Co. was clearing location for its first test in the pool at the 1 Kidder, SW SE NE 20-20n-9w, the east offset to the discovery.

ILLINOIS WILDCAT FAILURES

Bond County: Gilliam Drilling Co. 1 Kuleszo, NW NE SW 12-5n-5w, dry, TD 2,075 ft.

Effingham County: Eason Oil Co. 1 Scheiber et al, SE NW NW 2-6n-7e, dry, TD 2,998 ft.

Gallatin County: Edward Challon 1 Blackard, NW NW NW 19-7s-9e, dry, TD 3,188 ft.

The Texas Co. 1 McGuire, SE NE SW 15-9s-8e, dry, TD 2,739 ft.

Shelby County: T. M. Pruett et al 1 Rowley, SE NW NE 9-12n-2e, dry, TD 1,627 ft.

Central Area

ILLINOIS

George Aubrey and associates have a prospective Cypress sand well at their 2 B. C. Manker, located just north of the Clay City townsite in the SE NE SE 17-3n-8e, Clay County, in the Clay City-Noble Consolidated pool. Cypress sand is a new pay zone for that area of the field. Nearest Cypress production is more than a mile distant.

Saturation was topped at 2,650 ft., and at its present total depth of 2,675 ft., the well still is in the pay. Following a 90-minute drill-stem test of the zone which got 480 ft. of gas, 510 ft. of clean oil, and 330 ft. additional of mud and oil, casing was run for production tests. Bottom of the string is 1 ft. in the top of the pay. No water was indicated in the test. Bottom-hole pressure was 826 psi.

The Frogtown Devonian pool in Clinton County is getting one of its best wells yet completed where W. C. McBride, Inc., 7 Schroeder, NE SW 31-3n-3w, flowed 384 bbl. of oil in the first 4 hours (average 96 bbl. per hour), testing the pay at 2,250-55 ft. The pay is in the Dutch Creek zone, a limy sand in the Devonian. Total depth is 2,262 ft. with top of the Devonian at 2,236 ft.

WESTERN KENTUCKY

Stanford Oil Co. 1 Denton, 19-O-23, 2 miles southeast of Cairo, southern Henderson County, and a quarter mile northeast extension of the spreading Robards pool on the Webster-Henderson County line, flowed at the rate of 33 bbl. of oil per hour while testing its McClosky lime pay zone at 2,492-98 ft. Drilling is under way at 2 Denton, another location northeast.

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White County: W. O. Lucas 1 Goodman, NW NE SW 22-4s-10e, dry, TD 3,239 ft.

INDIANA WILDCAT FAILURES

Gibson County: Aubrey-Terrant 1 Redman, SW SE SW 28-3s-12w, dry, TD 2,848 ft.

Knox County: T & H Corp. 1 Kiel, Military Donation 204-4n-10w, dry, TD 1,962 ft.

Posey County: W. E. Witt 1 Lowe, SE NE NE 30-5s-12w, dry, TD 2,852 ft.

Sullivan County: R. Redifer et al-Drake, NE NW NE 33-9n-10w, dry, TD 800 ft.

Vigo County: F. B. Cline 1 Patton, NE NW SE 13-11n-9w, dry, TD 875 ft.

W. Usrey 1 Sweetzer, NE NE SE 10-11n-10w, dry, TD 2,015 ft.

Kansas

Good Oil Recovery Made By Ellsworth Wildcat

A NEW producing area appears to have been discovered in southern Ellsworth County where a wildcat drilled by E. K. Carey recovered 1,040 ft. of oil in a drill-stem test of showings found in Arbuckle lime. The prospective discovery well is 1 Maes, located in the SE SW SE 26-17-8. It is a mile east of the Edwards pool.

Top of the Arbuckle was logged at 3,341 ft. (—1,582 ft.). The successful test embraced an interval at 3,346-57 ft., where hole has been bottomed and casing run to 3,354 ft. Tester was open only 30 minutes. The above oil was recovered with 100 ft. of water. A previous 60-minute drill-stem test of the top 5 ft. of Arbuckle, 3,341-46 ft., was unsuccessful. Lansing lime, topped at 2,819 ft., also had some showings.

Continental Oil Co.'s new discovery well, 1 Gillespie, NE SE NE 34-5-27, southeastern Decatur County, in the northern part of the state, established a state pumping potential 1,192 bbl. per day, producing from Lansing lime with casing perforations extending through a series of intervals from 3,632 ft. to 3,820 ft. Located 2 miles northwest of the Adell pool, northern Sheridan County, the new pool has been given the name of Adell Northwest.

Continental also is testing another indicated discovery well, its 1 Hardesty, 2 miles to the north in the SE NE NE 22-5-27, but as this is written no estimate of productive capacity is available. Initial tests are being made of casing perforations at 3,806-14 ft. in Lansing lime. Hole had been drilled to 4,095 ft. in granite wash and casing run to 3,860 ft. Drill-stem tests indicated best productivity in an interval at 3,672-84 ft., where 2,190 ft. of clean oil was recovered.

Osborne County's first producing well, Anderson-Prichard Oil Corp. 1-A Ruggles, NW NW NW 23-10-15, pumped 193 bbl. of oil per day on state potential tests. Production is from the conglomerate zone in which casing is perforated at 3,394-99 ft. and 3,390-3,410 ft. Location of the discovery is in the southwest corner of the county, 5 miles from nearest other production, the Fairport pool, in Russell County.

R. E. Adams 1 Bromwell, C SW NW 7-34-29, a wildcat located 2 miles northeast of the East Adams Ranch gas-distillate area in southwestern Meade County, southwestern Kansas, swabbed 58 bbl. of oil in 12 hours while starting tests in Morrow sand, opposite which casing is perforated at 5,901-08 ft. Top of the Morrow sand is 5,899 ft. Hole is bottomed in the Mississippian at 6,180 ft. with casing run to 6,021 ft. Mississippian was topped at 5,964 ft. Surface elevation is 2,657 ft.

KANSAS WILDCAT SUCCESS

Barton County: Alpine Oil & Royalty Co., Inc., et al 1 Dorfshaffer, SE SE NE 34-19s-13w, pumped 28 bbl. oil at 3,234-44 ft., TD 3,463 ft., PBTD 3,256 ft. (Great Bend, East).

KANSAS WILDCAT FAILURES

Barton County: Victor 1 DeWerff, SW SE NW 32-20s-12w, dry, TD 3,515 ft.

Duke & Wood Drilling Co. 1 Luse, SW SW NE 8-20s-14w, dry, TD 3,645 ft.

Alpine 1 Byers, SE NE NW 33-18s-13w, dry, TD 3,417 ft.

Butler County: D. T. Ingling et al 1 Barker, SW SW NE 7-24s-3e, dry, TD 2,800 ft.

K. T. Weidemann 1 Perry, NW NW NE 15-29s-5e, dry, TD 2,879 ft.

Gove County: Musgrove Petroleum Corp. 1 Wilson, NW NW NW 16-12s-30w, dry, TD 4,600 ft.

Hodgeman County: S. Lelow 1 Reed, SE SE SE 15-23s-24w, dry, TD 5,241 ft.

I. W. Siegel et al 1 Wyott, SE NW NW 30-23s-24w, dry, TD 4,798 ft.

Marion County: Slusser Drilling Co.-J. Habiger et al 1 Mierhoff, SE NE SW 27-19s-5e, dry, TD 2,439 ft.

Phillips County: K & E Drilling, Inc., 1 Woodruff, SW SW SW 13-1s-20w, dry, TD 3,624 ft.

Reno County: Virginia Drilling Co., Inc. 1 Stucky, SE SE NW 28-26s-6w, dry, TD 4,276 ft.

Rice County: Stag Drilling Co. et al 1 Roth, SE SE SE 24-20s-9w, dry, TD 3,455 ft.

Rooks County: Jones, Shelburne & Farmer, Inc., 1 Thyfault, NW NW SW 29-7s-20w, dry, TD 3,683 ft.

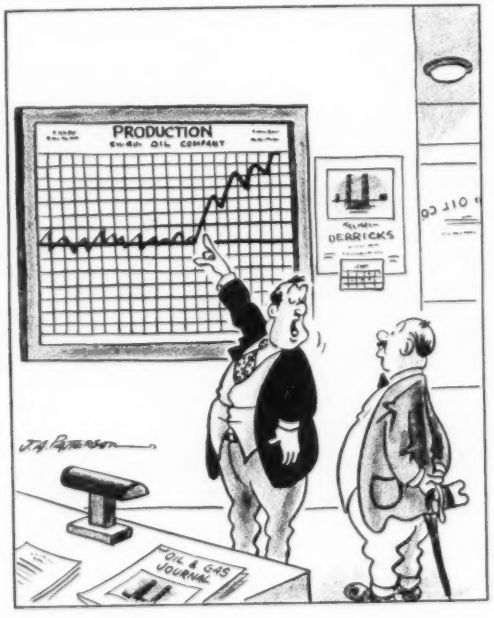
Stafford County: Lewis Drilling Co. 1 Herrell, SW SE NE 34-22s-11w, dry, TD 3,700 ft.

Jones, Shelburne & Farmer, Inc., 1 McCandless, NW NW SE 19-25s-13w, dry, TD 4,385 ft.

Sumner County: Herndon Drilling Co. 1 Alcorn, SE NE NE 33-34s-1e, dry, TD 4,069 ft.

Trego County: N. Appleman Co. 1 Marquand, SE SE NE 17-12s-21w, dry, TD 4,025 ft.

Don Pratt et al 1 Hamburg, SE NW SE 10-13s-22w, dry, TD 4,100 ft.



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December Completions Gain Over 1950, But Fall Short of November Record

DURING December operators drilled 3,734 wells, 7 per cent below November 1951. Oilers and dusters were both down, while gas wells increased by 10 over November. Footage drilled was down 755,638 ft., 4 per cent below November 1951.

December '51 vs. December '50

Comparing December with the corresponding period of 1950, the figures show that completions increased by 220 wells, or 6 per cent, and footage was up 1,949,813 ft., of 13 per cent.

The following paragraphs afford a sector-by-sector picture of how the two months compared:

Southwestern.—Texas and New Mexico together gained 22 well completions, or 1.5 per cent, and 851,555 ft., or 13 2 per cent.

Mid-Continent.—This area, made up of Oklahoma, Kansas, and Nebraska, reported an increase of 67 completions, or an 8 per cent increase. Footage increased 272,188 ft., or 9.2 per cent.

Rocky Mountain.—This section (including Montana, Wyoming, Colorado, Utah, and Dakotas) gained 47 well completions. This is a 40 per cent gain. In footage this region increased 292,087 ft., or 71 per cent. This section recorded the greatest increases percentagewise in completions and footage.

West Coast.—California gained 62 well completions. This is a gain of 37 per cent. In Washington a 3,714-ft. gas-condensate well was completed in December.

North-Central.—In the Ohio-Kentucky-Illinois-Indiana-Michigan group completions fell off for the second straight year. The area recorded 49 fewer completions or down 9.4 per cent. Footage was down 134,163 ft. in this area, or 11 per cent below the same period of 1950.

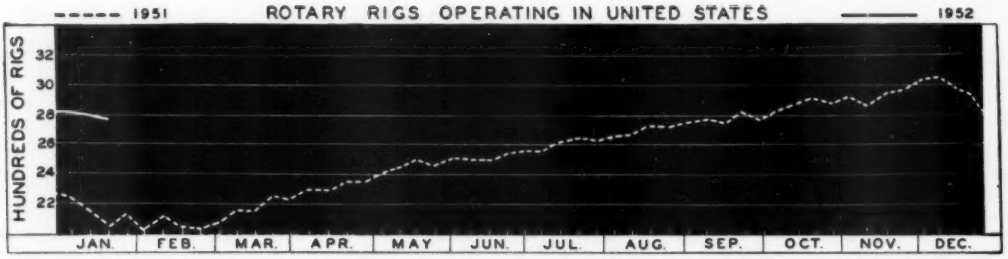
Eastern.—This area, including New York, Pennsylvania, and West Virginia, gained 22 completions, an 11 per cent increase. New York declined in footage, but Pennsylvania and West Virginia increased to bring about this footage increase for the area.

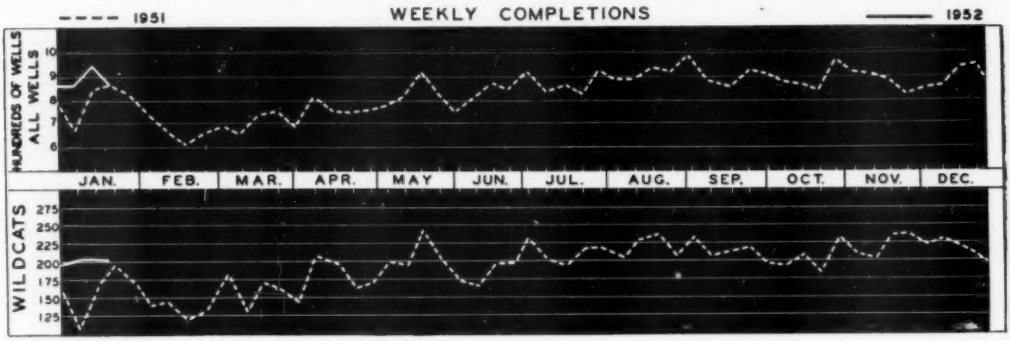
Southern.—In this area are included the chief producing states of Arkansas, Louisiana, and Mississippi. The well completions in this area increased by 37, and were evenly distributed among the three classes of wells—oil, gas, and dry. No significant fluctuation was noted in any one class. Footage drilled increased 263,351 ft.

SUMMARY OF COMPLETIONS—DECEMBER 1951

	Total comp.	Oil	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	10,000-12,500 ft.	Over 12,500 ft.	Total footage	Rigs and drilling
New York	34	18	0	16	34	0	0	0	0	0	48,500	48
Pennsylvania	142	54	22	66	121	5	15	0	1	0	303,290	185
West Virginia	40	6	30	4	22	17	1	0	0	0	113,361	228
Maryland	7	0	5	2	0	6	1	0	0	0	29,318	27
Ohio	79	29	18	32	38	41	0	0	0	0	172,742	144
Kentucky	105	32	19	54	72	33	0	0	0	0	206,154	79
Illinois	152	53	0	99	61	91	0	0	0	0	375,288	255
Indiana	89	28	0	61	72	17	0	0	0	0	159,779	186
Michigan	42	21	0	21	17	22	3	0	0	0	125,622	137
Kansas	427	197	24	206	47	371	9	0	0	0	1,469,318	480
Nebraska	25	4	3	18	4	13	8	0	0	0	113,986	36
Oklahoma	448	240	21	187	139	206	78	16	8	1	1,632,616	990
Texas	1,354	839	64	451	288	431	441	159	27	8	6,676,759	1,759
North	191	100	0	91	71	89	31	0	0	0	633,356	189
West Central	170	75	9	86	71	73	26	0	0	0	569,033	191
West	475	384	6	85	50	104	269	34	12	6	2,733,634	783
Panhandle	58	27	26	5	15	39	2	2	0	0	178,478	114
Eastern	78	41	3	34	1	28	27	22	0	0	472,107	86
Gulf Coast	193	101	13	79	14	55	41	67	15	1	1,231,149	217
Southwest	189	111	7	71	66	43	45	34	0	1	859,002	179
Louisiana	217	119	20	78	46	49	37	39	33	13	1,338,791	317
Northern	131	59	17	55	45	45	26	12	3	0	501,304	130
Southern	86	60	3	23	1	4	11	27	30	13	837,487	187
Arkansas	39	20	1	18	6	29	3	1	0	0	136,840	40
Mississippi	35	11	1	23	0	5	24	2	3	1	296,800	41
Ala., Ga., Fla.	3	0	0	3	0	1	1	0	1	0	21,077	5
Montana	33	10	0	23	20	13	0	0	0	0	94,020	55
Wyoming	63	26	1	36	8	26	19	8	1	1	320,234	169
Colorado	44	10	2	32	2	11	28	3	0	0	234,676	84
Utah	4	2	0	2	0	1	2	1	0	0	26,677	43
New Mexico	117	53	44	20	32	39	19	12	9	6	595,671	229
California	229	173	3	53	69	88	37	20	12	3	1,010,162	296
Miscellaneous	§6	2	0	4	2	1	1	1	1	0	30,517	18
Total December 1951	3,734	‡1,947	278	‡1,509	1,100	1,516	727	262	96	33	15,472,266	15,851
Total November 1951	4,038	2,040	268	1,730	1,253	1,643	742	273	101	26	16,227,904	5,901
Total December 1950	3,514	2,008	227	1,279	1,194	1,428	584	205	90	13	13,522,453	5,279
Cumulative 1951¶	44,516	23,453	3,030	18,033	14,738	18,455	7,363	2,638	1,082	240	172,331,330	
Cumulative 1950	43,279	24,430	2,843	16,006	15,764	17,302	6,800	2,288	968	157	159,287,865	
Alberta, Canada	83	42	16	31	17	42	38	1	1	0	357,837	
Cumulative 1951¶	1,234	768	111	355	147	568	496	17	6	0	5,220,035	
Cumulative 1950	1,017	759	41	±17	81	632	291	12	1	0	4,013,0 8	

*Incl. 90 service wells: N. Y. 16, Pa. 50, Ohio 6, Mich. 1, Kans. 9, Okla. 6, W. Tex. 1, SW. Tex. 1, W. Tex. 3, E. Tex. 17, Gulf Coast 14, SW. Tex. 10, N. La. 1, S. La. 4, Wash. 1. †Incl. 55 condensate wells: Okla. 5, W. Tex. 3, E. Tex. 17, Gulf Coast 14, SW. Tex. 10, N. La. 1, S. La. 4, Wash. 1. ‡Incl. all wells rigged up and/or drilling at month end. §Incl. 3 Dakotas, total 25,627 ft., 1 Wash. at 3,714 ft., and 2 Tenn. at 544 ft. and 632 ft. ¶Revised.





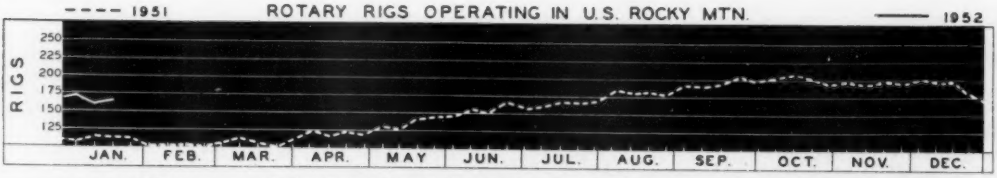
CURRENT STATISTICS

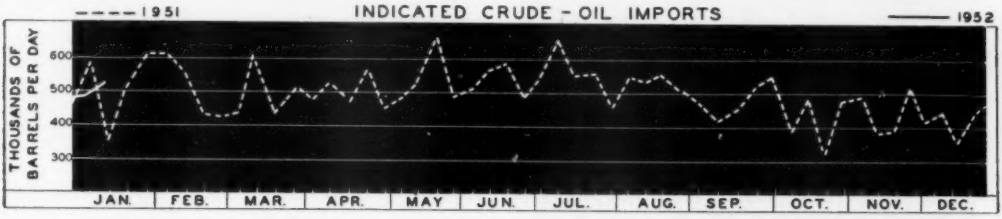
EXPLORATION

WEEKLY WELL COMPLETIONS . . . WEEK ENDED JANUARY 19, 1952

	Total of all wells					Jan. 19		Wildcat completions and discoveries									
													Cumulative total, 1952				
	Comp.	Oil	Gas	Dry	Footage	1952	1951	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	6	4	0	*2	9,000	20	23	0	0	0	0	0	0	0	0	0	0
Pennsylvania	28	12	5	†11	40,100	81	44	0	0	0	0	0	0	0	0	0	0
West Virginia	21	3	16	2	61,113	36	33	0	0	0	0	0	0	0	0	0	0
Ohio	22	4	4	†14	50,333	48	43	0	0	0	0	0	0	0	0	0	0
Indiana	17	7	0	10	33,001	56	62	0	0	0	6	6	4	0	0	20	24
Kentucky	16	2	8	6	36,632	64	60	0	0	0	0	0	1	0	0	9	10
Illinois	22	7	1	14	51,926	95	126	0	0	0	6	6	0	0	0	24	24
Michigan	7	4	0	3	24,268	30	31	1	0	0	0	1	4	0	0	9	13
Kansas	110	55	7	§48	372,386	296	214	1	0	0	18	19	6	0	0	61	67
Nebraska	10	0	0	10	21,906	20	13	0	0	0	9	9	1	0	0	15	16
Oklahoma	129	54	23	§52	455,425	370	320	2	0	1	16	19	6	0	3	37	46
Texas	320	156	7	157	1,536,022	847	880	10	1	2	101	114	32	3	7	210	252
North Central (Dist. 7-B & 9)	117	40	2	§75	406,967	282	248	6	0	1	51	58	23	0	1	105	129
West (Dist. 7-C & 8)	74	54	0	20	451,939	228	246	2	0	0	8	10	3	0	0	17	20
Panhandle (Dist. 10)	16	10	1	5	52,645	32	42	0	0	0	1	1	1	0	1	4	6
Eastern (Dist. 5 & 6)	15	10	0	5	77,411	33	57	0	0	0	3	3	0	1	0	5	6
Gulf Coast (Dist. 2 & 3)	52	24	4	24	327,811	144	164	1	0	1	17	19	1	1	2	37	41
Southwest (Dist. 1 & 4)	46	18	0	28	219,249	128	123	1	1	0	21	23	4	1	3	42	50
Louisiana	43	26	4	13	307,614	131	126	2	0	0	3	5	2	1	0	15	18
Northern	21	12	4	5	87,286	71	64	0	0	0	0	0	0	0	0	10	10
Southern	22	14	0	8	220,328	60	62	2	0	0	3	5	2	1	0	5	8
Arkansas	7	5	0	2	20,258	25	25	0	0	0	1	1	1	0	0	5	6
Mississippi	10	6	0	4	64,236	23	14	1	0	0	3	4	2	0	0	7	9
Southeastern States	0	0	0	0	0	2	5	0	0	0	0	0	0	0	0	1	1
Montana	1	1	0	0	2,547	17	14	0	0	0	0	0	1	0	0	5	6
Wyoming	10	7	1	2	65,930	41	35	0	0	0	1	1	4	0	0	4	8
Colorado-Utah	7	5	0	2	40,017	28	12	1	0	0	2	3	3	0	1	7	11
New Mexico	25	11	9	5	105,154	62	35	0	0	0	3	3	2	0	0	6	8
California	49	40	1	8	194,722	128	79	3	0	0	8	11	6	0	0	21	27
Miscellaneous (Md.)	1	0	1	0	3,980	6	0	0	0	0	0	0	0	0	1	1	2
Total United States	861	409	87	365	3,504,570	2,426	2,194	21	1	3	177	202	75	4	12	437	548
Total previous week	962	523	54	385	3,938,030			29	1	6	169	205	54	3	9	280	346
Total January 20, 1951	873	505	50	318	3,521,197			28	5	6	158	197	71	5	16	374	466

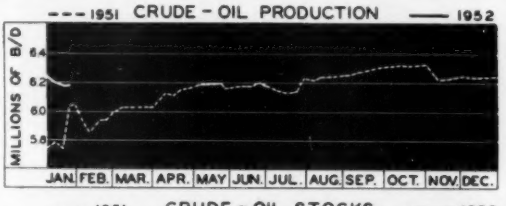
Service wells included: *2, †10, 13, §1.

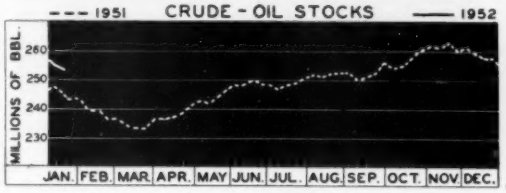




DAILY AVERAGE PRODUCTION FOR WEEK

	January 19, 1952			Jan. 12
	Crude oil	Lease condensate	Total	total
Alabama	2,700		2,700	2,800
Arkansas	77,640	5,300	82,940	82,950
California	983,200		983,200	982,500
Colorado	78,000		78,000	80,200
Eastern	56,500		56,500	57,000
Florida	1,750		1,750	1,750
Illinois	167,200		167,200	168,100
Indiana	30,200		30,200	31,200
Kansas	317,300		317,300	310,200
Kentucky	34,000		34,000	34,300
Louisiana	617,050	39,350	656,400	656,500
North Louisiana	113,650	14,350	128,000	128,100
South Louisiana	503,400	25,000	528,400	528,400
Michigan	37,200		37,200	37,500
Mississippi	96,650	5,050	101,700	101,695
Montana	24,000		24,000	24,250
Nebraska	7,600		7,600	7,900
New Mexico	153,525	300	153,825	153,825
Oklahoma	522,300		522,300	517,600
Texas	2,703,850	45,175	2,749,025	2,749,025
Dist. 1	32,150	225	32,375	32,375
Dist. 2	155,500	3,500	159,000	159,000
Dist. 3	449,100	24,350	473,450	473,450
Dist. 4	245,125	5,145	250,270	250,270
Dist. 5	51,400	325	51,725	51,725
Dist. 6	120,100	4,000	124,100	124,100
East Texas field	268,200		268,200	268,200
Dist. 7-B	83,800	100	83,900	83,900
Dist. 7-C	123,350	6,775	130,125	130,125
Dist. 8	934,375	525	934,900	934,900
Dist. 9	157,200	230	157,430	157,430
Dist. 10	83,550		83,550	83,550
Utah	4,100		4,100	4,200
Wyoming	184,000		184,000	184,500
Total U. S.	6,098,765	95,175	6,193,940	6,187,995
Change from previous week, up			5,945	
Canada	130,934		130,934	117,000
Total U. S. production January 1-19			117,678,145 bbl.	
Same period last year (crude plus cond.)			111,534,850 bbl.	



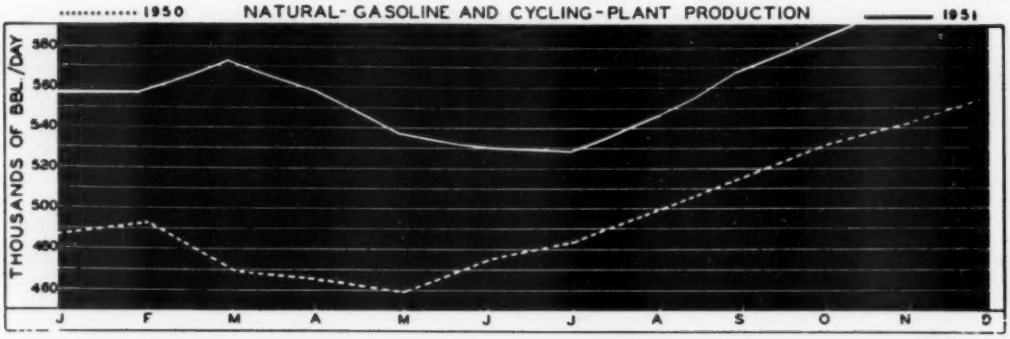


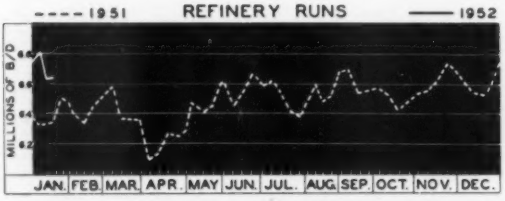
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

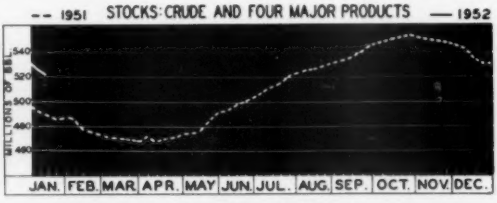
(Thousands of barrels)

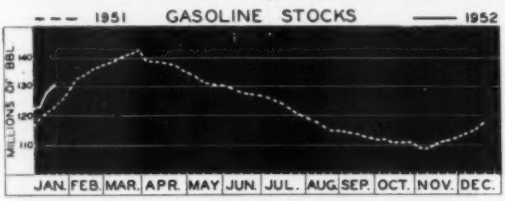
	Jan. 12, 1952	Jan. 5, 1952	Jan. 13, 1951
Pennsylvania Grade	1,990	1,939	2,088
Other Appalachian	1,719	1,778	1,249
Illinois, Indiana, Michigan	11,942	11,951	9,944
Arkansas	2,954	3,029	2,531
Louisiana	13,367	13,077	14,537
North	2,785	2,696	3,043
Gulf	10,582	10,381	11,494
Mississippi	3,402	3,418	2,869
New Mexico	7,110	7,108	7,261
Oklahoma and Kansas	40,589	41,306	38,605
Texas	121,211	123,333	116,640
East Texas Proper	11,522	12,778	(†)
West Texas	53,758	54,621	(†)
Texas Gulf	25,391	25,577	(†)
Other Texas	30,540	30,357	(†)
Rocky Mountain	13,731	13,325	11,803
California	29,170	29,638	31,457
Foreign	6,431	5,798	6,735
Total	253,616	255,700	245,719

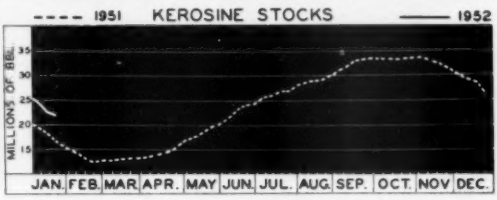
*Bureau of Mines. †Not comparable with current week.

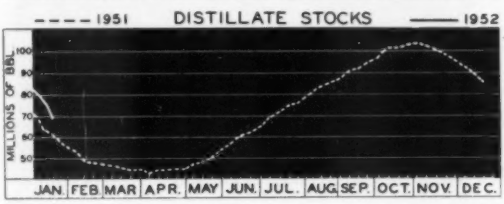


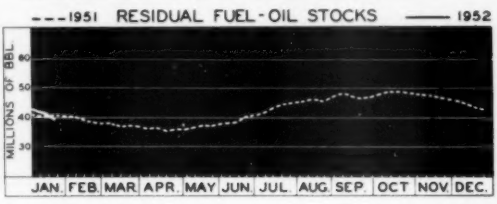










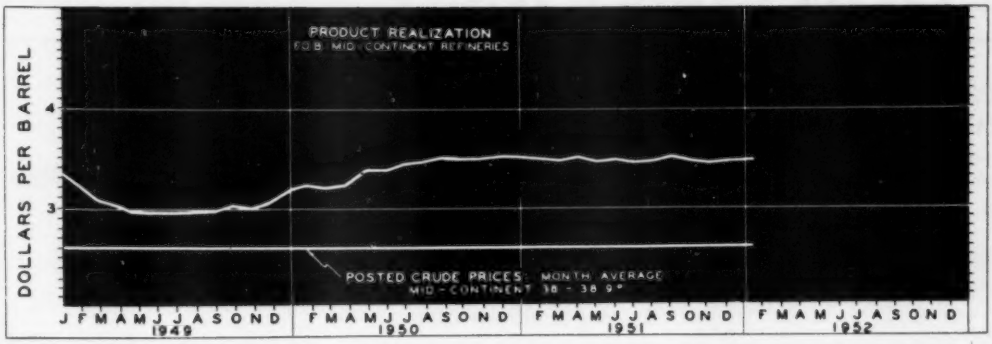


A.P.I. REFINERY REPORT, JANUARY 19

(Thousands of barrels)

District—	Daily avg. crude runs	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, January 1951				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual
East Coast	986	412.0	48.9	248.1	248.4	24,639	7,995	21,768	9,707	1,004	392.5	41.3	278.6	253.9
Appalachian:														
District 1	108	48.6	8.4	16.3	15.7	2,815	519	635	544	101	43.9	5.1	19.8	12.1
District 2	92	41.7	6.9	14.3	20.1	1,204	197	296	257	72	31.6	5.5	8.2	19.7
Ind., Ill., Ky.	1,253	635.0	91.0	231.4	184.6	30,140	4,753	13,713	5,658	1,195	606.5	82.0	232.8	193.2
Okla., Kans., Mo.	548	309.4	12.0	135.3	63.3	14,454	1,225	9,003	1,524	555	290.2	18.1	137.7	75.9
Inland Texas	252	179.2	15.3	32.6	40.9	5,013	407	1,362	1,186	225	143.6	13.7	33.3	41.7
Texas Gulf Coast	1,624	774.3	146.7	332.1	247.6	21,973	3,319	11,768	5,819	1,584	690.9	147.2	392.8	273.2
La. Gulf Coast	524	200.4	64.3	123.7	75.3	8,000	2,391	2,612	2,075	489	229.9	66.3	128.1	69.9
N. La. and Ark.	80	32.4	6.7	18.1	8.1	2,959	506	1,067	146	81	29.7	9.7	21.5	8.7
Rocky Mountain:														
New Mexico	14	9.2		2.6	3.7	142		58	30	14	8.0	.5	2.5	3.2
Other Rocky Mtn.	232	107.0	7.4	52.6	46.6	4,738	258	1,497	1,055	207	94.5	7.6	41.2	49.4
California	926	401.7	2.7	165.2	348.7	15,233	294	6,004	11,715	923	400.6	13.2	130.7	366.7
January 19, 1952	6,639	3,150.9	410.3	1,372.3	1,303.0	131,310	21,864	69,783	39,716	6,450	2,961.9	410.2	1,427.2	1,367.6
January 12, 1952	6,625	3,159.0	435.0	1,413.0	1,389.3	128,333	22,628	75,586	40,944					
January 20, 1951	6,505	2,960.6	418.0	1,338.0	1,376.7	123,782	17,177	61,147	40,109					

*At refineries included natural blended. †Finished and unfinished.


PRODUCT REALIZATION
F.O.B. MID-CONTINENT REFINERIES
DOLLARS PER BARREL
4
3
POSTED CRUDE PRICES: MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
J F M A M J J A S O N D
1949
F M A M J J A S O N D
1950
F M A M J J A S O N D
1951
F M A M J J A S O N D
1952

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil. Realization averaged $3.49 for week ended January 12, $3.49 for previous week, and $3.52 for January 1951.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of January 23, 1952. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Texas Gulf Coast
Regular gasoline, 80-82 octane	10-10⅜	12-12.75	10¾-11
Premium gasoline, 86-88 octane	11-11⅜	13.5-13.75	11¾-12
42-44 w.w. kerosine	9½-9½	10-10.1	9
No. 2 straw fuel oil	8¼-8½	9-9.25	8
No. 6 residual	$1.55-1.75	$2.45-2.60	$1.75-1.90

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	6⅞	6⅝	6⅝
Grade 18-55	8.25	7.75	8.0

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	13-13.5
750 vis., No. 3-4 neutral	16
2,000 No. 5-6 neutral	18-19

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29-30
200 vis., No. 3 neutral, 0-10 pp.	17.5-18.5

Western Pennsylvania

145-155 vis., 10 p.t. bright stock	32.5
180 vis., 0 p.t. neutral	31.5

WAX

Mid-Continent

132-134 A.M.P.	5.5

COLDER weather in the North Central states starting about January 20 has brought some improvement in markets for home-heating distillates following a period in which the market was near the classification soft.

In the first half of the month, there was about .125 cent between prices offered by prospective buyers and prices at which suppliers were willing to ship material. This stalemate was broken when the lack of movement forced some distillate on the market at prices under the low of the normal market. The unusual thing about the price of this material was that, whereas the difference between asking prices and buyers' offers had been estimated by many at about .125 cent in the first half of the month, some No. 2 was reported to have been released for sale at about .375 cent under the low.

While there has been no information on the volume of material available at this price, the fact that some No. 2 did move at distress prices just after the midpoint of the heating season may tend to discourage price advances over a period of the next few weeks unless demand is boosted by abnormally cold weather. After the end of February, most distributors will be working toward minimum inventories for the end of the season.

These price - inventory conditions exist only in the inland areas. Despite warmer - than - normal weather in northeastern states for the first half of the month, distillate prices remain firm.

Tank-wagon prices for gasoline to dealers were reduced 1 cent a gallon in the Detroit area effective January 22. The price war that started in Chicago early in December appears to be clearing up, but little progress has been reported for the New Jersey area.

The Group 3 residual market is still soft. Some of the excess material is moving to the gulf, but the demand from the normal market areas has not been large enough to prevent distress sales for northern shipment. Unless increased industrial activity reduces the surplus, inland residual prices may be influenced more by what the product will bring on the Gulf Coast.

CRUDE PRICES

GRAVITY SCHEDULE

	Signal Hill, Calif.†	Okla-homa, Kansas	Gulf Coast Tex.*	West Texas†
18-18.9	$1.93	....	....	....
19-19.9	1.98	....	....	....
20-20.9	2.03	$2.25	....	$2.12
21-21.9	2.07	2.27	....	2.14
22-22.9	2.13	2.29	....	2.16
23-23.9	2.18	2.31		2.18
24-24.9	2.24	2.33	$2.56	2.20
25-25.9	2.30	2.35	2.58	2.22
26-26.9	2.36	2.37	2.60	2.24
27-27.9	2.41	2.39	2.62	2.26
28-28.9	2.46	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.57	2.45	2.68	2.32
31-31.9	2.62	2.47	2.70	2.34
32-32.9	2.68	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947.

‡Standard Oil Co. of California

FLAT CRUDE PRICES

Representative posted schedules per barrel.

Kettleman Hills, California*	$2.80
Louisiana:	
Beauregard Parish	2.60
Cotton Valley (distillate)	2.85
Cotton Valley (crude)	2.70
Texas:	
East Texas	2.65
Pecos County (Yates)	2.31
Conroe	2.83
Van	2.48
Pennsylvania Grade:	
Bradford	4.25
Southwest Pennsylvania	3.62
West Virginia	3.76
Illinois Basin	2.77

*37°-37.9°.

EQUIPMENT MEN . . . in the News

United Centrifugal Names Miller, Brewer to New Posts

J. C. (Jack) Miller has been appointed by United Centrifugal Pumps as regional sales manager for the Mid-Continent area, according to an

J. C. MILLER

D. E. BREWER

announcement issued by the firm's Oakland, Calif., offices. The firm has also announced that Dahl E. Brewer has been placed in charge of sales throughout northern California and Utah.

For the past 17 years Miller has been closely associated with the petroleum industry and centrifugal-pump engineering, and his experience has been gained in California, New York, and South America, as well as through many years in the Mid-Continent area. With headquarters in Houston, Miller will work closely with United representatives in Tulsa, St. Louis, Denver, and other points throughout the region.

Brewer has served in various capacities for the Oakland manufacturing concern over a period of several years. He is widely known throughout the petroleum and other industries, having specialized for the past 15 years in engineering and sales of centrifugal pumps.

Wilson Joins Wright Petroleum Laboratories

Clair C. Wilson, formerly with Petroleum Production Laboratories, has joined Wright Petroleum Laboratories as chief engineer in charge of the Tulsa laboratory where he will supervise reservoir fluid analysis, routine and special core analysis, and research.

Wilson was formerly with Atlantic Refining Co. in crude-oil production research. His experience also includes experimental determination of gas equilibrium constants, development of secondary-recovery methods, secondary-recovery tests on large core samples at reservoir temperature and pressure using cores and bottom-hole fluid samples, in addition to the conventional reservoir fluid analyses on bottom-hole oil samples and recombined separator samples of oil and gas, and distillate and gas.

Tube Turns Appoints Hall To Mid-Continent District

LINCOLN D. HALL

John G. Seiler, executive vice president and general sales manager of Tube Turns, Inc., Louisville, has announced the appointment of Lincoln D. Hall as district manager in charge of the Mid-Continent territory. Hall will make his headquarters in Tulsa. He succeeds Robert S. Tyler, Jr., who has resigned to join the newly established Tyler-Dawson Supply Co., Tulsa.

Hall has had extensive experience in the fabrication of industrial piping, and for 10 years he was manager of stores and production department of C. F. Braun & Co., Alhambra, Calif. Prior to becoming associated with Tube Turns, Hall was the West Coast sales manager for Taylor Forge & Pipe Works.

Oil Capitol Plans Expansion Move

Oil Capitol Supply Co., Tulsa, is planning its third expansion move in a little more than 2 years. Started late in 1949 by the three principals above, Tom Word, Sam Word, and W. W. Compton, the company maintains complete warehouse stocks of general refinery supplies to serve the Mid-Continent area. The latest move is an extension on the main building which will add warehousing space.

Refinery Engineering Promotes Bruner

MAX T. BRUNER

Tom M. Lumly, president of Refinery Engineering Co., Tulsa, has announced the promotion of Max T. Bruner to vice president in charge of field construction. Bruner's duties in his new capacity include inspection and supervision of all construction work in the new field and their coordination with the home office in Tulsa.

Bruner has been affiliated with Treco since late 1942, having been located in Ashland, Ky., and Chicago before being transferred to Tulsa in 1947. He has held several positions of responsibility with Treco, coming to Tulsa as chief engineer in charge of engineering design. The responsibility of chief estimator was added in 1949.

Expanding activity of Refinery Engineering in the construction of catalytic cracking units in 1950 led to Bruner's promotion to chief engineer, from which position he was advanced to his new post.

Clark Bros. Forms South American Export Firm

The newly formed corporation of Clark Bros. Pan American, Inc., will act as the export corporation in Mexico and South America for Clark Bros. Co., Inc., Olean, N. Y., and will sell the engine and compressor products manufactured by that company, exclusively.

In addition to all sales activity, the new corporation will also handle all service and warehouse facilities in South America. No change is contemplated in the sales and office personnel now serving the South American petroleum, gas, and industrial fields.

In addition to its home office in Olean and an office in New York City, offices will be maintained in Mexico City, and in the South American cities of Caracas, Buenos Aires, Bogota, Lima, and Rio de Janeiro.

Officers in the new company are F. W. Laverty, president; J. B. O'Connor, R. E. Reimer, D. K. Hutchcraft, R. R. McCartney, and T. C. Webb, vice presidents.

(Continued on page 441)

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FOR SALE: One super model Wilson single drum servicing unit, 80 hp. Waukesha 4,000′ wire, all tubing tools, mounted on GM 4-wheel drive truck. $3500. Phone Rogers Pipe and Supply Co., Tulsa, Okla.

FOR SALE: One 125 H.P. Allis-Chalmers 1170 RPM 220 Volt, 31 Amphere, Type A.R. code F. 3 phase, 60 cycle, 24 hour, 40 degree rise induction electric motor. Never used. In original crate, priced at $1500.00. Located Cushing Refinery, Cushing, Oklahoma. Contact Huitt, Deep Rock Oil Corporation, Box 1051, Tulsa, Oklahoma.

FOR SALE: Ten 5½ Lufkin crank 72″ stroke pumping units complete with 15/30 H.P. electric motors and motor houses. Purchased 1934 never used. Located 4 miles east Gladewater, Texas. Priced $1800 each. Contact Huitt, Deep Rock Oil Corporation, Box 1051, Tulsa, Oklahoma.

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1—260,000 bbl. riveted tank, can be reset as a floating top.

1—60,000 bbl. tank, price on negotiation.

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RILEY STEEL CO.
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Machinery & Equipment Merchants

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All sizes; line pipe and casing, tanks, and Oilfield supplies. Edco Pipe & Supply Co., Phone 45970, P.O. Box 151, Tulsa, Oklahoma.

7500′ OF API Full Hole 4½″ Drill Pipe. Graded and tested by Sonoscope engineers. Milford Giffin, Giffin Hotel, Tel. 477, Hoisington, Kansas.

3963′ New 3½″ OD National 15.50# Grade E Range 2 Sml API External Upset Shot Peined Pipe with Hughes Internal Flush Flash Weld Tool Joints. Milford Giffin, Giffin Hotel, Tel. 477, Hoisington, Kansas.

Gaso Duplex 4½″ x 6″ Power Pumps with Chrysler C-36 Engines, skid mounted, immediate delivery. Also Byron Jackson, Carter Centrifugal Units. Westinghouse 20-25-50 KW Generating Units.

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Three Tanks: 25327 volume cubic feet, 180,000 gallon capacity, 35′-10″ high, 30′-0″ diameter. Weight 57,278 lbs., 5/16″ gauge, heating coils 300′-2″.

One Tank: 21,264 volume cubic feet; 170,000 gallon capacity, 30′-1″ height, diameter 30′-0″; weighs 49,675 lbs. Coils 300′-2″, 5/16″ gauge.

All in good usable condition. Priced reasonable. Phone, wire or write

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Reconditioned, double drum, Wilson Giant Model Drilling Rig with double 87-ft. telescoping mast poles with racking platform, driven by Model EKU Waukesha reconditioned 180 H.P. engine. 17½-inch slightly used dumbo buster oil bath rotary table, long sub base with all the foregoing mounted thereon. One 4-ft. fabricated drill pipe sub-structure for above unit.

One reconditioned 7¼ x 12 Model FXZ Gardner-Denver Power Pump driven by reconditioned Model NKU Waukesha 220 H.P. Gas engine. Pump and engine mounted on extended sub base complete with V-belt drive and guard.

Rig may be inspected at Empire Machinery Co. Odessa yard. For further details, Write—Wire or Phone.

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EQUIPMENT FOR SALE

USED rotary and cable tool drilling tools wire lines, E. A. Kelly, Box 861, Oklahoma City. Phone 5-6407.

SALES and Rental of Cable Drilling and Fishing Tools, Casing and Equipment from the Southwest's largest stock of used Cable Tools. Degen Pipe & Supply Co., Tulsa, Oklahoma.

COMPLETE GEOPHYSICAL EQUIPMENT

Everything needed including gravity meter, magnetometer, advanced surveying equipment and two four-wheel-drive jeeps, all in excellent condition. Geophysical firm in Texas merging with firm in northern California must sell for quick sale. Value of equipment, $20,000. Sale price, $8,000.00.

Write for particulars.
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Special Liquidation PRESSURE VESSELS Immediately Available

8—Used 10′ ID dia. x 40′ seam to seam x 3″ shell. Code constructed all weld. Heads 3½″. Test Pressure 900 psi. WP 600 psi.

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8—Used 8′ ID dia. x 40′ seam to seam x 2″ shell. Code constructed all weld. Heads 2¼″. Test Pressure 750 psi. WP 500 psi.

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Good condition. Built by A. O. Smith Corporation. Located near Chicago, Illinois, and offered subject to prior SALE.

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FOR SALE: Starting to dismantle Natural Gasoline Plant, five million CFD capacity at Benton, Illinois. Will sell all or any part of following:

STORAGE TANKS

Propane, Butane, Natural Gasoline

Unit No.—10A. **Quantity**—1. **Description**—Propane; Code welded; size 7-0 x 40-0; Cap. 12,000 gal; Horizontal; Shell thickness .781"; Heads 1.125"; W. Pressure 225 PSI @ 460° Temp.; Test Pressure 340 PSI; mounted on structural steel tank supports.

Unit No.—11-13. **Quantity**—3. **Description**—Butane; Code welded; size 6-5 x 35-0; Cap. 7,500 gal.; Horizontal; shell thickness .625"; Heads .750"; W. Pressure 150 PSI; Test Pressure 300 PSI; mounted on concrete saddles.

Unit No.—14-19. **Quantity**—6. **Description**—Casinghead Gasoline Storage; Cap. 8,000 gal.; riveted; Horizontal; size 7-0 x 27-0 x ¼; mounted on concrete saddles.

Unit No.—22. **Quantity**—1. **Description**—Steel Storage Tank; Cap. 12,000 gal; Vertical; Riveted; size 10-0 x 20-0 x ¼ (Mineral Seal Service)

Unit No.—23. **Quantity**—1. **Description**—Steel Storage Tank; Cap. 8,500 gal; Welded; Vertical; size 10-0 x 15-0 x ¼ (Lube Oil Service)

Unit No.—24. **Quantity**—1. **Description**—Steel Storage Tank; Cap. 1600 bbls; Bolted type; size 16-0 x 27-0 (Water Storage Service)

Unit No.—25. **Quantity**—1. **Description**—Steel Storage Tank; Cap. 2400 bbls; Bolted Type; size 24-0 x 27-0 (Cooling Tower Water Storage)

Unit No.—83. **Quantity**—1. **Description**—Steam Hot Well Storage Tank; Cap. 3500 gals; size 6-0 x 14-0 x ⅜

Unit No.—86. **Quantity**—1. **Description**—Air Tank; 3-0 x 17-0 x ⅜; Riveted; Butt Strapped; 300 lb. W.P.

COMPRESSORS—ENGINES

Unit No.—1. **Quantity**—1. **Description**—Clark Gas Engine & Compressor; size 17 x 18 x 26 x 20; Ser. 9556, 230 BHP, 125# PSI Discharge

Unit No.—2-3. **Quantity**—2. **Description**—Clark Gas Engines, Gas Compressor; size 17 x 18 x 24 x 20; Ser. 9554 & Ser. 9558, 230 BHP; 125# PSI Discharge

Unit No.—4. **Quantity**—1. **Description**—Clark Gas Engine, Gas Compressor; size 16 x 7" x 10 x 20; Ser. 7495 VS; 200 BHP; 300# PSI Discharge; Propane Recompressor Service

Unit No.—5. **Quantity**—1. **Description**—Bessemer Gas Engine, Gas Compressor; size 17 x 6¼ x 16 x 20; Ser. 45886; 165 BHP; 180 RPM; Partially dismantled but complete with all parts available

Unit No.—6. **Quantity**—1. **Description**—Clark Gas Engine Compressor; size 16 x 8½ x 20; Ser. 541; 80 BHP; 180 RPM; 300 PSI Discharge; Make Tank Recompressor

Unit No.—7. **Quantity**—1. **Description**—Clark Gas Engine Compressor; size 16 x 7½ x 20; Ser. 544; 80 BHP; 180 RPM; 300 PSI Discharge; Connected to this unit is a Quincy Air Compressor; size 5¼ x 3 x 3½, 2 stage, belt drive; 300 PSI Discharge

Unit No.—8. **Quantity**—1. **Description**—Clark Gas Engine "Bob Cat"; 40 HP Vertical Type; Ser. 13156; V-Belt Drive, Connected to Ingersoll-Rand Compressor; size 5 x 11 x 10, 2 stage, Horizontal Type, Ser. 75940-1; Suction 14.7; Starting Pressure 500-lbs.; Working Pressure 300-lbs. (Air Mixture Residue Gas)

Unit No.—9. **Quantity**—1. **Description**—Clark Gas Engine "Bob Cat"; 40 HP Vertical Type; Ser. 13159; Size 7" x 9; V-Belt Drive; Connected to Gardner-Denver Centrifugal Pump; size 8, Type 6, Cap. 2000 GPM; Ser. 259038; (Cooling Tower Service)

Unit No.—10. **Quantity**—1. **Description**—Curtis Air Compressor; size 4 3/16 x 2¼ x 3½; Ser. 9583; 2 stage; Direct connected to Briggs-Stratton gasoline engine; Model YY, Ser. 308110; size 5 HP

CENTRIFUGAL PUMPS

Unit No.—26. **Quantity**—1. **Description**—Worthington Cent. Pump; Cap. 300 GPM; size 3 x 3; Ser. 815892; Direct connected to Terry Turbine; Type ZA, Ser. 14843; Can be operated by Exhaust steam or gas. Connected to 8 coil Superheater consisting of 8 lengths of 4" Std. Pipe 20-0

Unit No.—27. **Quantity**—1. **Description**—Worthington Cent. Pump; Cap. 150 GPM; 130 TDH; size 2½" Ser. Q209A; Direct connected to Century Electric Motor, 5 HP, 1750 RPM, Single Phase, 110 V., Ser. 65489 (Cooling Tower)

Unit No.—28. **Quantity**—1. **Description**—Worthington Cent. Pump; size 4-L-1; Ser. 1011752; Direct connected to Coppus Steam Turbine, Type TF, Ser. 29074, 17 HP, 1750 RPM, size 16, Type TF6 Nozzles (Engine Cooling Tower)

Unit No.—29. **Quantity**—1. **Description**—Worthington Cent. Pump; size 4-L-1; Ser. 1022196; Direct connected to Howell Electric Motor, 7½ HP; 220 v.; Single Phase, 60 cycle, 1740 RPM, Ser. S1766 (Engine Cooling Tower)

Unit No.—30. **Quantity**—1. **Description**—Worthington Cent. Pump; Cap. 800 GPM; 6" suction; 4" discharge; Direct connected to Sturtevant Steam Turbine, Type 6, #144811, suction 1½", discharge 1"

Unit No.—32. **Quantity**—1. **Description**—Berke Co. Cent. Pump; size 1½ x 1¼; Fig. V3C28; Ser. 167123; Direct connected to ½ HP Electric Motor (Boiler Feed Service)

Unit No.—33. **Quantity**—1. **Description**—Worthington Monoblock Pump; size 2½ x 2; Ser. B111348-5; Direct connected in single assembly to Master Electric Motor, Explosion Proof Type; 20 HP, 3 Phase, 60 cycle, 350 RPM; Style 98y, Type P.A.

Unit No.—34. **Quantity**—1. **Description**—Bingham Pump; Ser. 9918; Directed in single assembly to General Electric Explosion Proof Motor, 20 HP, 3500 RPM, 3 Phase, 60 cycle, Ser. 5578674

RECIPROCATING STEAM PUMPS

Unit No.—37. **Quantity**—1. **Description**—National Transit Duplex; 10 x 7 x 12; Ser. 22430; Inlet 4"; Discharge 4"; (Oil circulation)

Unit No.—38. **Quantity**—1. **Description**—Fairbanks-Morse Duplex; 4½ x 3 x 4; Ser. 58926; Inlet 2"; Discharge 1½" (Interstage)

Unit No.—39. **Quantity**—1. **Description**—Worthington HiVol Simplex; 6½ x 3 x 8; Ser. 931223; Inlet 2" Discharge 1½" (Propane Reflux)

Unit No.—40. **Quantity**—1. **Description**—National Transit Simplex; 6 x 4 x 10; Ser. 29803; Inlet 3"; Discharge 2½" (De-ethinizer Reflux)

Unit No.—41. **Quantity**—1. **Description**—Worthington HiVol Simplex; 8 x 5 x 12; Ser. 1032583; Durable Type; Suction 4"; Discharge 3" (Charge)

Unit No.—42. **Quantity**—1. **Description**—National Transit Duplex; 10 x 4½ x 10½; Ser. A-31256; Valve Pot Type; 4" Suction; 4" Discharge

Unit No.—43. **Quantity**—1. **Description**—National Transit; Simplex; 10 x 6½ x 12; Ser. 29804

Unit No.—44. **Quantity**—1. **Description**—National Transit; Duplex; 10 x 4½ x 10; Dwg. C-1625; Valve Pot Type; 4" Suction; 4" Discharge; (Boiler Feed)

Unit No.—45. **Quantity**—1. **Description**—Union Steam; Simplex; 10 x 6 x 12; Ser. 186488; 4" Suction; 3" Discharge; (Boiler Feed)

Unit No.—46. **Quantity**—1. **Description**—Dean Bros.; Simplex; 8 x 5 x 12; Ser. 49448; Durable Type; 4" Suction; 3" Discharge; Extra New Liquid End

TOWERS & VESSELS

Unit No.—55. **Quantity**—1. **Description**—Absorber; 4-0 x 34-0 x ⅜ Shell; Top Head ¾"; Bottom Head 1¼ thick; 14 Trays ¼" Plate, 14-ga. B.A. Sheets; Bubble Caps Girth Seams double riveted outside;; Butt Strap Joints except Heads which are double riveted lap joint; Longitudinal joints double riveted; Bottom joint triple riveted; All seams welded inside and out; All rivets completely welded; Outside Test 450 PSI; W.P. 300 PSI; Tulsa Type Mist Extractor; Weight approx. 25,000 lbs.

Unit No.—62. **Quantity**—1. **Description**—Depropanizer; 4-0 x 48-0 x ½; shell; ¾" Heads; 30 Trays-⅜" Plate; Downcomers 3/16" Plate; Seals ¼" Plate; 14-ga. B.A. Sheet Bubble Caps; 2" O.P. Rizers and 1-18" Manway; Test Pressure 450 PSI; W.P. 300 PSI; Connected to reboiler 3-0 x 14-0; Containing 49 Steel U-Tubes; 200 sq. ft.; Reboiler Shell ½"; Heads ¾"; Welded construction; 300 PSI; Max. Temp. 650°; Made by Tulsa Boiler Works, Ser. 41150

Unit No.—67. **Quantity**—1. **Description**—Debutanizer; 2-0 x 50-0 x 5/16 shell; ⅜" Heads; 30 trays ¼" Plate; Downcomers 10-ga. sheets; Bubble Caps 14-ga. B.A. Sheet; Hydro Test 375 PSI; W.P. 250 PSI; Equipped with Reflux Condenser 2-8 x 4-0 x ⅜; Containing 346 Tubes ¾" OD x 3-0, 113 sq.ft.; Tubes 120 PSI; Shell 375 PSI, 3 pass x 50-0

Unit No.—52-53. **Quantity**—2. **Description**—Field Scrubbers, 7-0 x 10-0 x ¼; Riveted, Vertical

Unit No.—54. **Quantity**—1. **Description**—Interstage Accumulator; 7-0 x 12-0 x ½; Welded, Vertical.

Unit No.—56. **Quantity**—1. **Description**—Residue Scrubber; 4-0 x 15-0 x ½; Riveted, Horizontal

Unit No.—57. **Quantity**—1. **Description**—Vent Tank; 5-0 x 20-0 x ⅜; 65 PSI; Temp 190°; Riveted

Unit No.—58. **Quantity**—1. **Description**—Still; 5-0 x 16-0 x ¾"; Welded; 40 PSI; 330° Temp; Vertical; SW Eng. Co. Ser. 4901

Unit No.—59. **Quantity**—1. **Description**—Dephlegmator; 5-0 x 18-0 x ⅜; Welded; Vertical; 2 Trays; W.P. 45 PSI; Test 70 PSI; SW Eng. Co. Ser. 4900

Unit No.—60. **Quantity**—1. **Description**—Make Tank; 5-0 x 15-0 x 5/16; Welded; Horizontal.

Unit No.—61. **Quantity**—1. **Description**—Recompressor Scrubber; 2-7 x 8-0 x 7/16; 300 PSI; Welded

Unit No.—84. **Quantity**—1. **Description**—Water Leg. Make Tank; 2-7 x 8-0 x ½ Shell; Riveted; Vertical

Unit No.—85. **Quantity**—1. **Description**—Water Leg. Make Tank; 2-0 x 12-0 x ¼ Shell; Welded; Vertical

Unit No.—87. **Quantity**—1. **Description**—Water Leg. Scrubber; 3-0 x 10-0 x 5/16; Riveted; Vertical

Unit No.—88. **Quantity**—1. **Description**—Pressure Jet Tank; 5-0 x 21-0 x ¼; Riveted

Unit No.—64. **Quantity**—1. **Description**—Compressor Scrubber; 2-0 x 10-0 x 7/16; ⅜" heads; W.P. 300 PSI; Temp 100°; Welded

Unit No.—65. **Quantity**—1. **Description**—De-ethinizer; 1-0 x 19-0 x ⅜ shell; ½" heads; with Reboiler containing 36 tubes ¾ x 3-0, 21 sq.ft. Test Pressure Vessel 440 PSI; 220° Temp; Tubes 250 PSI; 400° Temp.

Unit No.—66. **Quantity**—1. **Description**—Reflux Accumulator; 1-0 x 10-0 x ⅜ shell; ½" heads; Design Pressure 440 PSI; Temp 100°

Unit No.—68. **Quantity**—1. **Description**—Reflux Accumulator; 2-0 x 10-0 x ⅜ shell; ⅜" heads; Welded; Vertical

Unit No.—69. **Quantity**—1. **Description**—Perco Treaters; 3-0 x 12-0 x 3/16 shell; ¼" heads; Design Pressure 105 PSI; Welded; Vertical

Unit No.—71-72. **Quantity**—2. **Description** — Caustic Wash Towers; 2-0 x 20-0 x ⅜ shell; ½" heads; Baffles ¼" Plate; Seamless; Vertical; W.P. 250 PSI

Unit No.—73. **Quantity**—1. **Description**—Propane Gravel Tower; 2-0 x 10-0 x ⅜ shell; ½" heads; Seamless; 250 PSI; Vertical

Unit No.—74-75. **Quantity**—2. **Description**—Propane Dehydrator Tank; 1-4 x 6-6 x ⅜ Seamless Shell; ⅜" heads; with 4 x 8 Mesh; W.P. 250 PSI; Vertical

Unit No.—77. **Quantity**—1. **Description**—Superheater Feed Tank; 1-4 x 10-0 x ⅜ Seamless Tank; ½" heads; 250 PSI

Unit No.—78. **Quantity**—1. **Description**—High Stage Accumulator; 4-0 x 11-0 x ⅜; Welded; Vertical; W.P. 250 PSI

HEAT EXCHANGERS

Unit No.—47-48. **Quantity**—2. **Description**—Southwestern; W.P. 100 PSI; Type HG 1250; size 52 x 30 x 44; Contains 1,280 tubes, Admiralty, ¾" OD x 2-6; Surface Area 630 sq.ft.

Unit No.—49-50. **Quantity**—2. **Description**—Southwestern; W.P. 100 PSI, Type H 750-48; sizes 30 x 36 x 60; Contains 1,536 tubes, Admiralty; ¾" OD x 4-6; Surface Area 750 sq.ft.

Unit No.—51. **Quantity**—1. **Description**—Tulsa Type Preheater 0-8 x 20-0 w/22 ¾" OD 14-ga. Seamless Steel Tubes; 162 sq.ft.; 250 PSI; Test in 3 sections; can be operated

Unit No.—174. **Quantity**—1 lot. **Description**—Brass tube cooling sections as follows:

12 — 57 — 1" OD Tubes	20-0	295 sq.ft./sec.
19 — 86 — 1" OD Tubes	20.0	186 sq.ft./sec.
1 — 88 — 1" OD Tubes	20-0	450 sq.ft./sec.
1 — 92 — 1" OD Tubes	20-0	482 sq.ft./sec.
1 — 20 — 1" OD Tubes	20-0	104 sq.ft./sec.

TOTAL SURFACE — 8,110 sq.ft.

BOILERS

Unit No.—170-173. **Quantity**—3. **Description**—125 HP Broderick Co. locomotive type ASME Code; Boilers operated at 200 lbs. pressure; 98 Boiler Tubes 3" x 14-0; complete with Steel Stacks; fired by Sonner Mfg. Co. Gas Burners; fully equipped with all accessories ready for use. Insurance inspection certificates available.

COOLING TOWER

Unit No.—174. **Quantity**—1. **Description**—Atmospheric Cooling Tower—12-0 x 66-0 x 43-0; Lilie-Hoffman Mfr.; Fabricated of Pacific Coast Redwood, Brass Bolts, Nuts & Washers, Copper Nails, Ladder & Hand Rails, 11 Bays, each Bay having 10 Cooling Decks. Designed to cool 1,000 GPM; Brass Sections as follows:

12 — 57 — 1" OD Tubes	20-0	295 sq.ft./sec.
19 — 86 — 1" OD Tubes	20-0	186 sq.ft./sec.
1 — 88 — 1" OD Tubes	20-0	450 sq.ft./sec.
1 — 92 — 1" OD Tubes	20-0	482 sq.ft./sec.
1 — 20 — 1" OD Tubes	20-0	105 sq.ft./sec.

TOTAL SURFACE — 8,110 sq.ft.

VALVES and FITTINGS
Various Sizes and Types

BUILDINGS

Unit No.—175. **Quantity**—1. **Description**—Compressor Building 32-0 x 120-0 x 12-0 with 13 steel windows 4-10 x 7-0; 2 double slide doors and 1 pedestrian door; Fabricated of Pipe Trusses and covered with Corrugated Iron Siding; can be easily dismantled and re-erected.

Unit No.—176. **Quantity**—1. **Description**—Boiler House 20-0 x 50-0 x 10-0 with skylight length of building; Steel framing & covering; sectional and portable.

(Continued on next page)

Salesman on premises. Contact R. V. Crisp, Telephone 1419 or 610, Benton, Illinois, or Norman Strauss, Kansas City, Missouri

BROWN-STRAUSS CORPORATION

Kansas City 10, Mo. — **P. O. Box 78** — **Harrison 1000**

(Continued from preceding page)

Unit No.—177. **Quantity**—1. **Description**—30-0 x 30-0 x 8.0 Wood Frame; Steel Corrugated Iron Covering
Unit No.—178. **Quantity**—1. **Description**—20-0 x 40-0 x 8.0 Wood Frame; Steel Corrugated Iron Covering
Unit No.—179. **Quantity**—1. **Description**—16-0 x 16-0 x 8.0 Wood Frame; Steel Corrugated Iron Covering
Unit No.—180. **Quantity**—1. **Description**—10-0 x 26-0 x 6-0 Wood Frame; Steel Corrugated Iron Covering

MISCELLANEOUS

Unit No.—164. **Quantity**—1. **Description**—General Electric Motor; 10 HP; Sec. KW 3668; 440 v; 1740 RPM; 3 Phase; 60 cycle
Unit No.—165. **Quantity**—1. **Description**—General Electric Motor; 50 HP; Ses. 3886613; 440 v; 1740 RPM; Type KH327
Unit No.—166-169. **Quantity**—3. **Description**—Fisher Governor; size 4"; new in original crate
Unit No.—79. **Quantity**—1. **Description**—Trident 2 Compound Water Meter; Ser. 5966975

PROCESS INSTRUMENTS

(all 24-hr. movements)

Unit No.—100-103. **Quantity**—3. **Description**—Bristol Free Vane Flow Controller; Model KR51140MF; Serial F3002; Chart F10000; Ser. F2716; Ser. F2717
Unit No.—104. **Quantity**—1. **Description**—Bristol Recorder; Model 40M; Serial 198881; Chart #4641; Range 0-200 PSI
Unit No.—105. **Quantity**—1. **Description**—Bristol Recorder; Model 40M; Serial 182209; Chart #4635; Range 0-50 PSI
Unit No.—106. **Quantity**—1. **Description**—Foxboro Recorder; Chart #79874; Range 0-250 PSI
Unit No.—107-109. **Quantity**—2. **Description**—Foxboro Temperature Controller & Recorder; Serial C34290; Chart #878330; Class 2; Range 50-300° F.
Unit No.—110. **Quantity**—1. **Description**—Foxboro Temperature Recorder; Serial C47810D; Chart #878379; Class 2; Range 50-200.
Unit No.—111. **Quantity**—1. **Description**—Foxboro Pressure Recorder; Serial C50913; Chart #89875; Type HS; Range 0-300 PSI
Unit No.—112. **Quantity**—1. **Description**—Taylor Temperature Recorder #76V1741; Chart #OP524; Range 80-360° F
Unit No.—113. **Quantity**—1. **Description**—Tagliabue Temperature Recorder; 0-500° F; Chart #50008
Unit No.—114. **Quantity**—1. **Description**—Taylor Temperature Recorder #76JM2208; Chart 200; Range 0-110° C
Unit No.—115. **Quantity**—1. **Description**—Tagliabue Temperature Recorder; Chart 200-0-8; Range 0-200° F
Unit No.—116. **Quantity**—1. **Description**—Foxboro Pressure Recorder #C79433; Chart #79809
Unit No.—117. **Quantity**—1. **Description**—Foxboro Temperature Controller & Recorder #B45879; Chart #778345; Class 2
Unit No.—118. **Quantity**—1. **Description**—Hanlon Waters Liquid Level Pilot Motor Valve Controllers Type 1410; 2 Indicators; 1 Gauge Diaphragm; 1 Gauge Supply; Both 0-30 PSI
Unit No.—119. **Quantity**—1. **Description**—Hanlon Waters Liquid Level Pilot Motor Valve Controller, Type 2/0
Unit No.—120. **Quantity**—1. **Description**—Hanlon Waters Pressure Pilot Controller, Type 275; Serials 11874, 11875, 11869, 11251, 11850, 10249, 11049, 10,962, 11857
Unit No.—121. **Quantity**—1. **Description**—Taylor Direct Acting Temperature Controllers, #7R1872 & #7R1873
Unit No.—122. **Quantity**—1. **Description**—Taylor Reverse Acting Temp. Controllers, #7R1872 & #7R1873
Unit No.—123. **Quantity**—1. **Description**—Fisher Pressure Controller, Type 4100 SR; Max. Pressure 75 PSI
Unit No.—124. **Quantity**—1. **Description**—Fisher Governor Wizard Control #676558; Type 4256A; size 1½"; stainless steel trim; ¾ valve travel; diaphragm 3-13 PSI; Pressure in Diaphragm opens Main Valve; Inner Valve Type DP V-Port
Unit No.—125. **Quantity**—1. **Description**—Fisher Governor Wizard Control #635770; Type 4256A; size 1½"; stainless steel trim; ¾" valve travel; diaphragm 3-12 PSI; Pressure in Diaphragm opens Main Valve; Inner Valve DP V-Port

MOTOR VALVES & KIDNEY FLOATS

Unit No.—126. **Quantity**—1. **Description**—Fisher Motor Valve #B34430; size 3" (Controlled Pressure on Butane Tower)
Unit No.—127. **Quantity**—1. **Description**—MacClear Motor Valve; size 3" (Controlled Pressure on Absorber)
Unit No.—128. **Quantity**—1. **Description**—Fisher Motor Valve; size 2" (Repressuring Gas Wells)
Unit No.—129. **Quantity**—1. **Description**—Chaplin Fulton Motor Valve; size 3"; lever operated (Controlled back pressure on Residue)
Unit No.—130. **Quantity**—1. **Description**—Tracyfire Steam Drier; size 2"; #7818 (Agitated Still)
Unit No.—131. **Quantity**—1. **Description**—Hanlon Waters Motor Valve; size ¾"; 300 PSI @ 450° F; Diaphragm Pressure 2-15 PSI; #22323; Valve travel ¼"; Type Inner Valve SPNB (Controlled Liquid Level Propane Reboiler)
Unit No.—132. **Quantity**—1. **Description**—Hanlon Waters Motor Valve; #20192; size ¾"; Type KA2; Valve travel ¼"; Type Inner Valve SPRAD; (Controlled Steam Temp #1 Reboiler)
Unit No.—133. **Quantity**—1. **Description**—Hanlon Waters Motor Valve; Type 86D; #24218; 2-15 PSI; Diaphragm Pressure; size 1"
Unit No.—134. **Quantity**—1. **Description**—Hanlon Waters Motor Valve; Type KA2; #20397; size 1"; 250 PSI @ 450° F; ½" valve travel; Type inner Valve SPPF; 2-15 PSI Diaphragm Pressure (Controlled Liquid Butane Reboiler)
Unit No.—135. **Quantity**—1. **Description**—Hanlon Waters Motor Valve; Type KA2; #20194; size 1¼"; Type Inner Valve DPRHD (Controlled Steam Butane Reboiler)
Unit No.—136. **Quantity**—1. **Description**—Fisher Motor Valve; Type 57; #486883; size 1"; (Controlled Steam #1 Reflux Pump)
Unit No.—137. **Quantity**—1. **Description**—Fisher Motor Valve; Type 555; #771561; size ¾"; stainless steel trim; 7/16" valve travel; 2-15 PSI Diaphragm pressure; Type Inner Valve DP-V-Port (Controlled Speed De-ethinizer Reflux Pump)
Unit No.—138. **Quantity**—1. **Description**—Taylor Motosteel Motor Valve; size ¾"; #2V7013 (Controlled Reflux to Dephlegmator)
Unit No.—139. **Quantity**—1. **Description**—Hanlon Waters Motor Valve #27326; size 1"; Type 86D; 2-15 PSI Diaphragm Pressure; 400-500 PSI W.P.; ¾" Valve travel; Type Inner Valve SPRAD (Controlled Pressure of De-ethinizer)
Unit No.—140. **Quantity**—1. **Description**—Hanlon Waters Motor Valve #25802; Type 86D; size 2"; 250-450 PSI W.P. Type Inner Valve DPRAD (Controlled Pressure of De-ethinizer)
Unit No.—141. **Quantity**—1. **Description**—Fisher Kidney Float; operated pilot valve which operated Fisher Motor Valve; size 3"; #B128882 (Absorber Input)
Unit No.—142. **Quantity**—1. **Description**—Fisher Motor Valve; Type 235C; #429548; size 4"; (Pressure Control for Make Tank)
Unit No.—143. **Quantity**—1. **Description**—Chaplin Fulton Back Pressure Regulator; size 1" (Butane Accumulator)
Unit No.—144. **Quantity**—1. **Description**—Hanlon Waters Kidney Float #27317; Style KA2; Type KA2; 125 PSI @ 450° F; size 1½" (Butane Accumulator)
Unit No.—145. **Quantity**—1. **Description**—Hanlon Waters Kidney Float #38548; Trim KA2; Type 850; size 2"; 450 PSI @ 750° F (De-ethinizer Service)
Unit No.—146. **Quantity**—1. **Description**—Hanlon Waters Kidney Float #20952; Type 850; size 1½"; 250 PSI @ 450° (Propane Reflux Accumulator)
Unit No.—147. **Quantity**—1. **Description**—Mercoid Swing Check #438376; Ratio PSH 18; RI 1/6; DC 1/6; 115/230 v.; 4 amp; (Shut down Propane Recompressor if Scrubber filled)
Unit No.—148. **Quantity**—1. **Description**—Fisher Kidney Float; size 1½" w/pilot (Still)
Unit No.—149. **Quantity**—1. **Description**—Fisher Water Trap; size 1½"; float type (Dephlegmator)
Unit No.—150. **Quantity**—1. **Description**—Hanlon Water Kidney Float; gas oil service; 300 PSI @ 750° F; Trim KA2; size 1½"; #38547
Unit No.—151. **Quantity**—1. **Description**—Fisher Motor Valve #42705; Type 57; size ½"; 5-14 PSI Diaphragm Pressure (Liquid Level Controller for De-ethinizer)
Unit No.—152. **Quantity**—1. **Description**—Fisher Motor Valve #791838; Type 57T; size ½"; stainless steel trim; ⅜" valve travel; 0-13 PSI Diaphragm Pressure; Type Inner Valve D-SP Plug (Control Feed Propane Tower) ⅜" Valve travel
Unit No.—153. **Quantity**—1. **Description**—Chaplin Fulton Motor Valve; size ¾" (Reflux Butane Tower)
Unit No.—154. **Quantity**—1. **Description**—Taylor Motosteel #2V700TU; size ½" (Level Reflux Accumulator)
Unit No.—155. **Quantity**—1. **Description**—Hanlon Waters Kidney Float #27325; trim KA2; Style 850; 300 PSI @ 450° F (Control Level Make Tank)
Unit No.—156. **Quantity**—1. **Description**—Steam Trap; size ¾" (Butane Reboiler)
Unit No.—157. **Quantity**—1. **Description**—Steam Trap; size ¾" (Propane Reboiler)
Unit No.—158. **Quantity**—1. **Description**—Steam Trap; size 1" (Steam Line Dead End)
Unit No.—159. **Quantity**—1. **Description**—Hanlon Waters Kidney Float #20193; Style KA2; Type 850; 300 PSI @ 450° F; size 1½" (Control Level Propane Reboiler)
Unit No.—160. **Quantity**—1. **Description**—Hanlon Waters Kidney Float #26529; Style KA2; Type 850; 250 PSI @ 450° F; size 1½" (Control Level Butane Reboiler)
Unit No.—161. **Quantity**—1. **Description**—MacClear Motor Valve; size 3"
Unit No.—162. **Quantity**—1. **Description**—Maxim Silencer; #20 Model MVC 213754; 2-8 x 8-0; size 10"
Unit No.—163. **Quantity**—1. **Description**—Fisher Kidney Float #426905; size 1½"; operated Foxboro Motor Valve; size 1" (Accumulator Service)

FIELD GAS METERS

Unit No.—170-177. **Quantity**—7. **Description**—New Type—Westcott Orifice Meter #84710; 20 PSI Static Pressure; 20 PSI Diff.; Chart #M305T; 2 Pen; Mfg. by American Meter Co.; 7 day movement
Unit No.—178. **Quantity**—1. **Description**—Old Type—Westcott Recording Diff. & Static Pressure Gauge #1599; Static Pres. 500 PSI; Diff. 50 PSI; Chart M3054; 7 day mvt.

Salesman on premises. Contact R. V. Crisp, Telephone 1419 or 610, Benton, Illinois, or Norman Strauss, Kansas City, Missouri.

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FOR SALE at Oklahoma City, used couplings with one dutchman, 3" 50c, 4" 75c, 6" $1.00. Cities Service Oil Company, Patridge, Bartlesville, Oklahoma.

FOR SALE: Model 61 Wichita Spudder, complete with 150 H.P., LeRoi Drilling Engine, all tools, dog house, light plant, and Shear Pole Mast. Rig is mounted on 12" I Beam Skids. Located in West Texas. Box E-559, The Oil and Gas Journal, Tulsa, Oklahoma.

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FOR SALE: U-34 Unit Rotary Rig, C-150 pump, 5½′ substructure, Lee C. Moore mast, 4200′ of 4½″ drill pipe, all complete, A-1 condition, eleven months old. H. Waggoner Drilling Company, Box 4657, Oklahoma City, Okla.

1076′ 5½″ OD 24.70# Grade E Range 2 SML Drill Pipe with 7⅝″ OD Reed Super Shrinkgrip Tool Joints. Milford Giffin, Giffin Hotel, Tel. 477, Hoisington, Kansas.

FOR SALE: Gear Reducers, two, 100 hp., new, right angle. 1300 new admiralty tubes, 1″ x 7′ long. Chemsol, Inc., 74 Dod Court, Elizabeth 3, N. J.

PUMP JACK, OWS 3500′ rating, slightly used $1150. OWS #4 swivel $200. Tables, pipe, collars, rotaries. Spudders, engines, cable tools, block, etc. Good used equipment. Complete stock of fishing tools. Pressey & Son, Pueblo, Colo.

EVERYTHING in Cable Drilling tools new-used, 4600 items. Send for list. TRI STATE TOOL & SUPPLY CO., Box 827, Parkersburg, W. Va.

FOR SALE: Shot Hole Rig—Franks KC 45—mounted on Tandem Chevrolet. Water truck 1951 Dodge—700 gal. Griffin tank, 200 ft. drill pipe, complete and in excellent condition. E. E. Hubbard, Phone 4926, 1206 N. 11th, Garden City, Kansas.

FOR SALE: Westcott, Foxboro and Emco Gas Meters. Geo. R. Milner, Box 124, Okmulgee, Oklahoma.

THREE 4¾″ x 30′ Drill collars. American overshot. One 9″ x 25′ Drill collar. One elevator for drill pipe. Kiowa Drilling Company, Inc., 717 Union National Bank Building, Wichita, Kansas.

1 BIGNALL & KEELER pipe threading machine 2″ to 8″ capacity. Electric driven, $1500. 15,000′ 5½″ O.D. flues, P.E., beveled cut for welding. Sutcliffe Pipe & Supply, Chanute, Kansas. Pho. 1644.

6000 FT. used Jones—7 sucker rods at Oklahoma City, 30c a ft. Write M. R. Travis, Box 1343, Tulsa, Oklahoma.

FOR SALE: Two 110,000 gallon oil storage tanks. One 225,000 tank in good condition. Priced for quick sale. Can be cut down and re-erected. Moorhead Machinery & Boiler Co., 10th and 2nd Avenue Southeast, Minneapolis, Minn. Phone Lincoln 8954.

JACKS—Jacks—Jacks—I still have a few Jenson Jacks left also two hundred ton Hydraulic Jacks. A. R. Daniel, Garnett, Kansas.

T & C Deep Well Gas Lift Pump. Capable of lifting 1250 bbls. per day from 8500 feet. Write Geo. L. Thompson, P.O. Bin J, Avenal, California.

GEO. FAILING core drill unit model 44 mounted on 1946 Ford truck with four-wheel drive, 2⅞ drill pipe, dog house on trailer, tools, light plant and water tank. Phone or write Kelly Heyen or Harry Ruyle, Dorchester, Illinois.

FOR SALE at our Sasakwa Gasolene Plant, Section 7-6N-8E, Seminole County, Oklahoma, 10 miles South of Wewoka and 1 mile East of Highway 56—4 24′ x 28′ carpenter built, modern houses, 4 room $2250.00 each plus tax. 1—3 room, $750.00 plus tax. All to be moved. Cities Service Oil Company, Patridge, Bartlesville, Oklahoma.

BETHLEHEM MC 250 drawworks, V belt compound with twin disc clutches, D-13,000 Caterpillars. Located at Duncan, Oklahoma. Keating Drilling Co., Midland, Texas. Phone 2-2473.

EQUIPMENT WANTED

WANTED: Blower, 2000-3000 C.F.M. at 10-12# pressure. Chemsol, Inc., 74 Dod Court, Elizabeth 3, N. J.

WE BUY well drilling equipment, machines, cable tools, pipe, etc. Turn your surplus equipment into cash. Pressey & Son, Pueblo, Colorado.

WANTED: Triplex Type Pumps, minimum 300 barrels per day capacity at 1,000 PSI and 0 to 10 PSI suction and up. 1″ Regular Black Line Pipe; 1″ long collar line pipe and 1¼″ upset tubing. Must be in good condition. Lynch Oil Company, P. O. Box 614, Evansville, Indiana.

HELP WANTED

KEY Seismograph Personnel Needed by Established and Expanding Seismograph Company. Box E-264, The Oil and Gas Journal, Tulsa, Oklahoma.

ADMINISTRATIVE and field sales personnel. Engineering education and/or background necessary. Knowledge of petroleum and chemical industries desirable. Apply: The J. B. Beaird Company, Inc., P.O. Box 1115, Shreveport, Louisiana.

SEISMIC SUPERVISOR—Outstanding opportunity for a capable geophysicist who is able to supervise seismic crews for an expanding contract company. Minimum of five years' experience necessary. Box E-542, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED surveyors and computors for foreign service with Gravity Crews. Top salary, subsistence, and travel expense. Best working conditions. Our personnel has knowledge of this ad. Apply Box E-543, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Geologist with petroleum engineering background with several years experience for employment in Mexico. Reply giving full particulars of experience and education. Box E-564, The Oil and Gas Journal, Tulsa, Oklahoma.

EXPERIENCED Production Wellhead equipment engineer, familiar with separators, heaters, treators and controls, able to design equipment, develop and supervise installations in field. Permanent position with Tulsa area Fabricator. Our employees know of this advertisement. Reply Box E-536, The Oil and Gas Journal, Tulsa, Oklahoma

WANTED: Chief Engineer, preferably one who has had at least six or more years in refining with some asphalt and processing engineering experience to take charge of maintenance and new construction. Location Northeast Texas. Box E-558, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL Industry Employment Service, Tom Robinson, owner, 405 Tuloma Building, Tulsa, Okla. 4-5974. No fees. For technical and trained oil industry personnel. Write us. Needed now: Geologists with Masters some experience. Experienced oil well supply salesmen.

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One of the leading integrated manufacturers of wire rope seeks mature engineer familiar with rotary drilling equipment particularly, and possessing inherent desires and personality to sell. Initial location to be in Rocky Mountain area servicing oil fields, however future opportunities are unlimited, dependent upon the man. Remuneration dependent upon experience, etc.; if interested write this periodical care Box E-537, The Oil and Gas Journal, Tulsa, Oklahoma, giving full details on education, experience, salary desired, etc. Your inquiry will be held in strict confidence; our organization knows about this advertisement.

ENGINEERS, Executives, Technical Men. Salaried positions—$3600 to $30,000. This confidential service for outstanding men who desire a change of connection. Will develop and conduct preliminary negotiations without risk to present position. Send name and address for details. Tomsett Associates, 334 Frick Bldg., Pittsburgh 19, Pa.

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Experienced in well treatment work. No sales work involved. Starting salary $600.00 per month. Box E-554, The Oil and Gas Journal, Tulsa, Oklahoma.

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For gas holder erection work in field. Must be willing to travel, work from blueprints and capable of testing, supervising welders, and demonstrating welding procedures. Prefer men with rigging experience. Write, giving experience, personal data, education, and salary requirement.

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5535 Vine Street, Cincinnati 16, Ohio

HELP WANTED

REFINERY MANAGEMENT and supervisory openings with independent refiner and chemical plant. These include Superintendent, Chief Engineer, Operating Supervisor and Process Engineer with good initial pay and the unlimited future of expanding small organization. Box E-565, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLER wanted for work in Syria. To supervise drilling with spudders, and pump installation for irrigation project. Box E-568, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLERS experienced in operation of Failing, Mayhew, and similar portable equipment, for exploration work in Persian Gulf area. One year contract. Top wages. Living furnished. Give full details of experience in reply to American Independent Oil Company, 111 Sutter Street, San Francisco.

PETROLEUM engineer approximately 38-40 years of age with production and drilling experience to take active part in the promotional work of a well established oil well service company covering the Mid-Continent area with headquarters in Houston. Send reply to Box 8013, Houston.

INDEPENDENT producer and drilling contractor needs petroleum engineer with production experience. Box E-549, The Oil and Gas Journal, Tulsa, Oklahoma.

SITUATIONS WANTED

MATURE Graduate and Registered Petroleum Engineer, familiar with drilling, production and oil field services, wants position with progressive independent. Box E-560, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No. 131. Ph. No. 131, Hobbs, New Mexico.

CORROSION and communications engineer with ten years experience desires permanent, responsible position with utility or pipe line company. Box E-540, The Oil and Gas Journal, Tulsa, Oklahoma.

OIL micropaleontologist, degree, 10 years California experience, wants to work well samples on consulting basis. Box E-556, The Oil and Gas Journal, Tulsa, Oklahoma.

DRILLING Engineer—Toolpusher 17 years—Four years College—Name Your Proposition. Box E-566, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER-GEOLOGIST, age 33, 4 yrs. Major Co., 2½ yrs. large Independent. Experience in Geological, Reservoir, Development Engineering, and practical production, Mid-Continent and Pacific Coast. Desires position as field production engineer, or geological engineer, with active independent. West coast or Rocky Mountain area preferred. Box E-567, The Oil and Gas Journal, Tulsa, Okla.

PETROLEUM engineer with graduate work in reservoir engineering and secondary recovery, 33, single, desires connection with strong independent. 1½ years drilling and production; 1 year proration and production in Southwest Texas. Presently employed. Box E-570, The Oil and Gas Journal, Tulsa, Oklahoma.

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GRADUATE Chemical Engineer, Age 27, with diversified Refinery experience as Plant Supt., Asst. Supt., Plant Engineer, Refinery Chemist, desires employment with independent. Box E-552, The Oil and Gas Journal, Tulsa, Okla.

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FOR SALE—MAPS

PERMIAN BASIN DEVELOPMENT MAP of West Texas and Southeast New Mexico. Scale 1"—64,000'. Pools discovered prior to 1951 in blue, 1951 discoveries and extensions in red. Price $2.50 per copy. Midland Map Company, Box 1211, Midland, Texas.

NOTICE

A. J. (AL) WELBORN
(Oil Properties)
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Removal of his offices from 1306 Broadway to Suite 1010-1011 Lubbock National Bank Building, Lubbock, Texas.

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VALVE MANUFACTURER wanted to produce and market on royalty basis, patented fire and pressure protection valves for industrial, marine and railroad uses. Consulting services on distribution offered. AUER INDUSTRIES, Box 25, Princeton, N. J.

GERMAN manufacturer of highly competitive steel drum faucets and drainers desires volume producing representatives and distributors. Box E-571, The Oil and Gas Journal, Tulsa, Oklahoma.

ORGANIZATION now serving as manufacturers representatives seeking additional quality lines for oil field and industrial trade in Oklahoma, Kansas, and Texas. P. O. Box 1201, Tulsa, Oklahoma.

WANT
N. Y. EXPORT REPRESENTATION?

Long established and well known oil well equipment manufacturer who has maintained N. Y. export office and sales personnel for many years, is now in a position to handle additional representation in New York for high quality manufacturers of oil equipment items. If you're looking for increased export business, write for further information. All replies held in strict confidence.

Box E-359, The Oil and Gas Journal, Tulsa, Oklahoma

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WILL pay cash instantly for leases (large blocks), royalties, mineral deeds, production. Write fully—P. O. Box 2133, Denver, Colorado.

OVER 2,500 acres leases, Margaret Tollett, Thomas Brooks Survey, Rains County, Texas. Important wildcat producer recently completed this county. Acreage reasonable. Write Roy Morgan, Personal, P. O. Box 1748, Atlanta 1, Georgia.

HAVE over twenty thousand acres leases along Missouri River on North Dakota-South Dakota line. All ten year leases ten cent rentals. Interested in selling shooting option with right of selection. If interested write Box 107, El Dorado, Arkansas.

HAVE 50 acres 1¼ mile from new discovery of oil wells South East Texas. Will sell 1/16 Royalty for $1000.00 Per Acre. Write John E. Gore, 409 Platt St., Toledo, Ohio.

INVESTMENT funds from excess taxpayers by independent oil operator. For exploratory well drilling immediately. Geologically favorable. Illinois basin. Box E-569, The Oil and Gas Journal, Tulsa, Oklahoma.

HUGOTON Embayment and Anadarko Basin Leases & Royalties, Western Oklahoma and Southwest Kansas Areas. John P. Mathis, P. O. Box 1106, Amarillo, Texas.

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EQUIPMENT MEN

(Continued from page 436)

Totco Names Morrison to Gulf Coast Division

A. MORRISON

H. H. (Pete) Peters, vice president of Technical Oil Tool Corp., Los Angeles, has reported the recent appointment of Alfonso (Al) Morrison as field service engineer to the Gulf Coast Division, headed by R. L. O'Rear.

Morrison will be stationed in Victoria, Tex., and will service the area covered by the Continental Supply Co. stores at El Campo and Refugio, Tex.

Insul-Mastic Holds Annual Technical Forum

The Insul-Mastic Corp. of America, makers of heavy protective coatings, held its annual sales and technical forum for the company's licensees in New Orleans November 5-7. The 3-day meeting featured speakers holding important engineering positions in well-known companies. There were also group discussions led by experienced licensees, at which company personnel acted as moderators.

Insul-Mastic manufactures heavy homogenized mastic coatings for protecting metals from acids, alkalis and moisture.

Leading off the technical side of the program was Prof. Elmer R. Queer, of Pennsylvania State College, who spoke on the "Effect of the Transmission of Moisture Vapor on Protective Coatings, Building Construction, and Insulation."

W. H. Zane, chief insulation engineer of E. I. du Pont de Nemours & Co., spoke on "Relationship Between Insulation and Protective Coatings."

The problems of preventing corrosion in steel mills were discussed by Herbert L. Coe, superintendent of maintenance at the Clairton Works of United States Steel Co.

Frank R. Jelinek, chief engineer of Neches-Butane Products Co., told of his company's expensive experience

with corrosion caused by water-soaked insulation on its fractionation towers.

Raymond Thomas, staff engineer of Union Carbide & Carbon Corp., closed the convention on the third day with his talk on the application of water-repellant coatings to thermal insulation.

Clark Is Named to Wyoming Post by Canadian Firm

A. Clark of Casper, Wyo., has been appointed a director and vice president in charge of exploration of Federated Petroleums, Ltd., it was recently announced by R. A. Brown, Jr., president of the company.

For the past 5½ years Clark has been division geologist of Shell Oil Co., Rocky Mountain division, with headquarters in Casper. During 23 years with Shell, Clark has held various positions in the United States and Canada. From 1941 to 1943 he was in charge of exploration for Shell in Canada and was closely associated with the development of Jumping Pound gas field.

Clark will head an intensive exploration program on Federated's 600,000-acre holding in the Williston basin area in Montana, North and South Dakota, and Saskatchewan.

Kelley Names Whitcomb, Davis to Executive Posts

James L. Whitcomb has been elected executive vice president of Kelley Manufacturing Co., of Houston and San Antonio, according to a recent announcement by Mrs. Edward W. Kelley, president of the firm. The election of J. Keith Davis as vice president and sales manager was also announced.

Kelley Manufacturing Co. is a wholesale distributor of steel products and a leading southwestern manufacturer of metal stampings for industry. The Kelley plant at Houston manufactures stampings for the oil, tool, L.P. gas and other southwestern industries.

J. K. Davis and J. L. Whitcomb

WECO Adds Llewellyn, Hull To Sales Organization

W. J. LLEWELLYN

W. C. HULL

W. J. (Jimmy) Llewellyn and W. C. (Bill) Hull have recently joined the sales organization of Well Equipment Manufacturing Corp.

Llewellyn will make his headquarters in Lubbock, Tex., and will serve the Texas Panhandle and New Mexico. Before joining WECO he spent several years in the drilling and production division of an oil company operating on the Gulf Coast.

Hull will have headquarters in Russell, Kans., from where he will cover the oil fields of Kansas. Prior to becoming a member of WECO sales force, Hull worked for several leading drilling contractors in Kansas.

Kersh Is Appointed Executive Vice President

R. S. KERSH

The board of directors of Westinghouse Electric International Co. has announced the election of Robin S. Kersh as executive vice president. He succeeds E. V. Huggins, who was recently named assistant secretary of the U. S. Air Force.

For the past year Kersh has been manager of the steam division of the Westinghouse Electric Corp., at Lester, Pa.

Kersh joined Westinghouse in East Pittsburgh, Pa., in 1929, and since that time he has spent 7 years in the company's offices at Atlanta and Birmingham, and 5 years as branch manager at Houston. He returned to East Pittsburgh in 1947 as manager of the industrial department, and in 1949 was named manager of the central station department.

Klemp Co. Announces Expansion Program

William F. Klemp Co., manufacturers of structural steel footwalks, open steel bridge decking, grating, treads, Hexteel and Floorsteel surface armors, Flexteel conveyor belting, and steel mats and meshes of various types, has announced completion of a $300,000 expansion program, including the addition of 50 per cent extra floor space at its Chicago plant, plus a new forge-welded grating assembly line.

Emerson C. Whitney, president of the company, has also announced plans for additional expansion in 1952, approximating $500,000.

New Firm to Specialize In Oil-Country Signs

An announcement has recently been made of the organization of a new enameling firm in Tulsa. US Enameling Co., P.O. Box 4116, Tulsa, has purchased the old facilities of Waltrip Enameling Works.

US Enameling has modernized and expanded the facilities of the old firm and will specialize in the manufacture of baked-on-engine signs for the petroleum industry, including signs for pipe-line right-of-way, pipe-line stations, producing leases, offices, warehouses, plants, and distributing facilities.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, Washington 25, D. C. Notice is hereby given that the SW¼NE¼ sec. 22, T. 21 S., R. 15 E., M.D.M., California, 40 acres, within the known geologic structure of the Jacalitos field, will be offered for oil and gas leasing through competitive bidding to the qualified bidder of the highest cash amount per acre at 1 p. m., Eastern Standard Time, February 27, 1952, when bids will be opened. The details of the lease offering and how and where to file bids may be obtained by addressing an inquiry to the Manager of the Land Office, Sacramento, California, or to this office. Marion Clawson, Director.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the E½ of lot 1 of the NW¼ sec. 4, T. 29 S., R. 27 E., M.D.M., within the known geologic structure of the East Premier field, California, will be offered for oil and gas leasing, through competitive bidding, to the qualified bidder of the highest cash amount per acre, at 1 p. m., Eastern Standard Time, February 27, 1952, when bids will be opened. Details of the lease offering and how and where to file bids, may be obtained by addressing an inquiry to the Manager of the Land Office at Sacramento, California, or to this office. Marion Clawson, Director.

LEGAL

SEALED bids will be received at the office of the Area Director, Bureau of Indian Affairs, Room 305, Federal Building, Albuquerque, New Mexico, until 2:00 o'Clock P.M., MST, February 12, 1952, and then publicly opened for sale of oil and gas leases on 55 tracts of Jicarilla Tribal Indian land located in the Rio Arriba and Sandoval Counties of New Mexico on the Jicarilla Indian Reservation, totalling approximately 136,984.07 acres. Each tract, containing approximately 1920 to 2600 acres, is offered for lease separately. For complete description of the land, location, provisions and stipulations of the leases to be sold, address the Superintendent Jicarilla Indian Agency, Dulce, New Mexico. Guy Hobgood, Superintendent.

LEGAL

701.03 ACRES of Allotted Indian lands located in Townships 12, 13 and 14 South, Ranges 21 and 15 East, SLBM, within the jurisdiction of the Uintah and Ouray Reservation, Utah, are being advertised for lease, bids on which will be opened January 31, 1952, at the office of Forrest R. Stone, Superintendent, Uintah and Ouray Agency, Fort Duchesne, Utah. Full particulars may be obtained from Mr. J. R. Schwabrow, U. S. Geological Survey, Casper, Wyoming, or from the Uintah and Ouray Agency.

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The S&J Emergency Vent, illustrated below and identified as Fig. ST-5455A serves the dual purpose of emergency venting of air surges or unusual thermal conditions, and also protects the tank roof from rupture due to overfilling.

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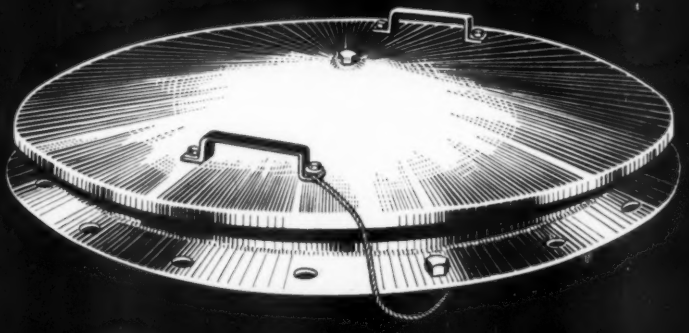

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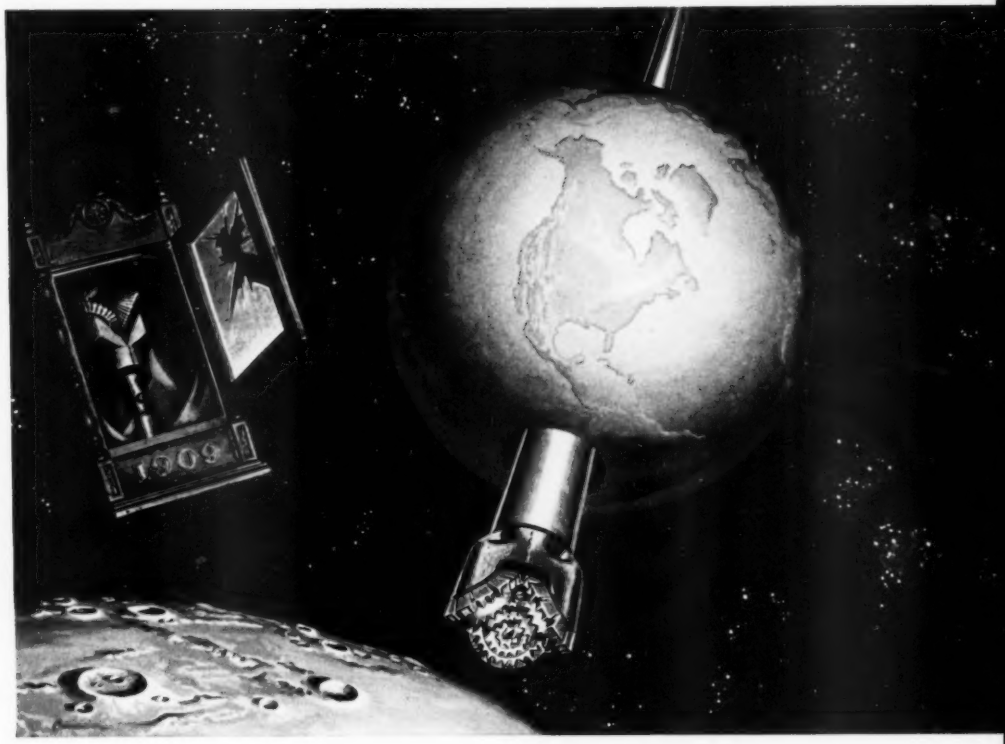

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